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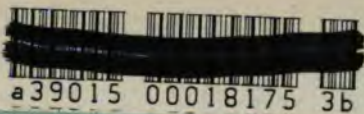
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THIRTEENTH BIENNIAL REPORT

OF THE

State Fish and Game Warden

TO THE

GOVERNOR OF THE STATE OF IOWA.

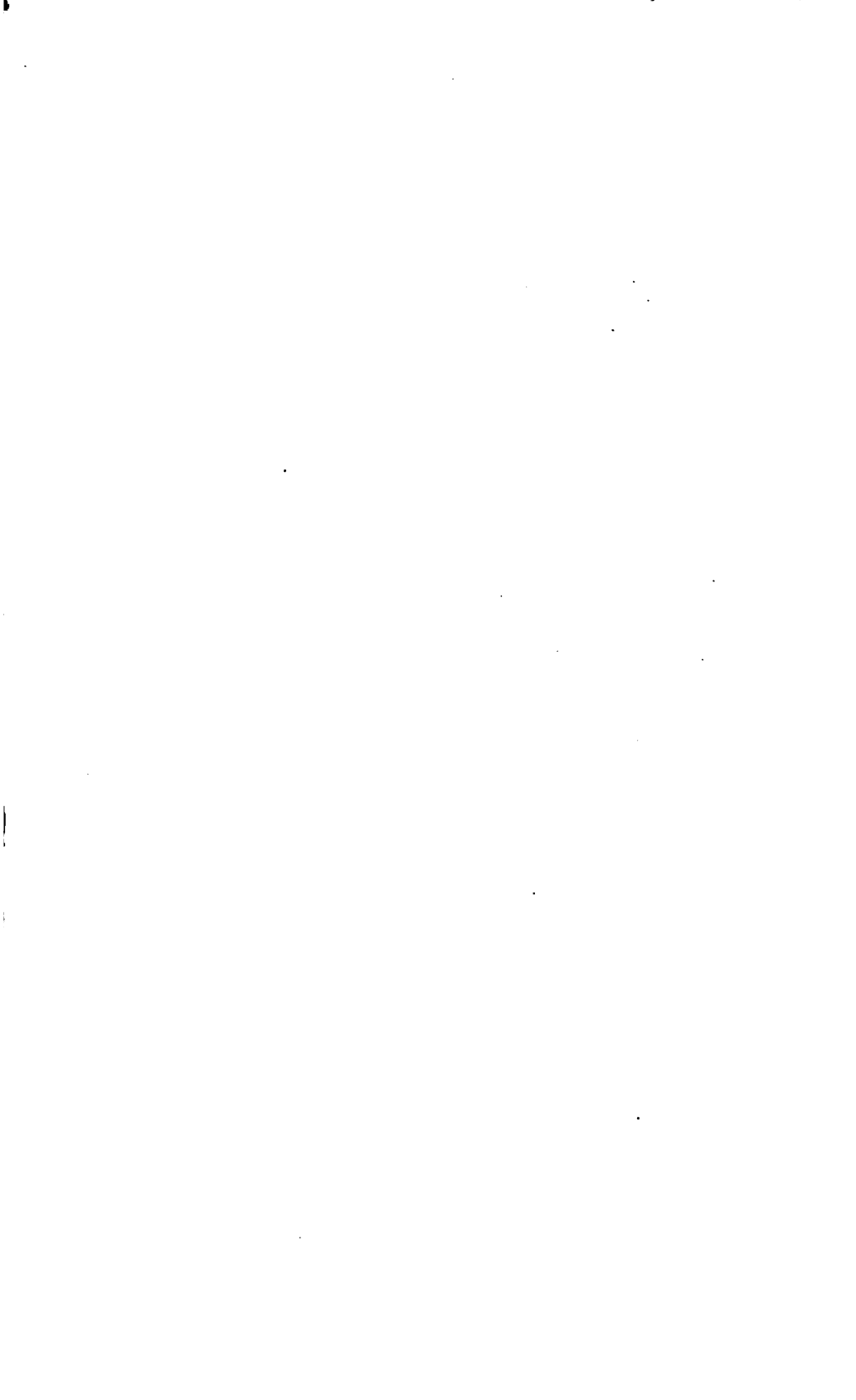
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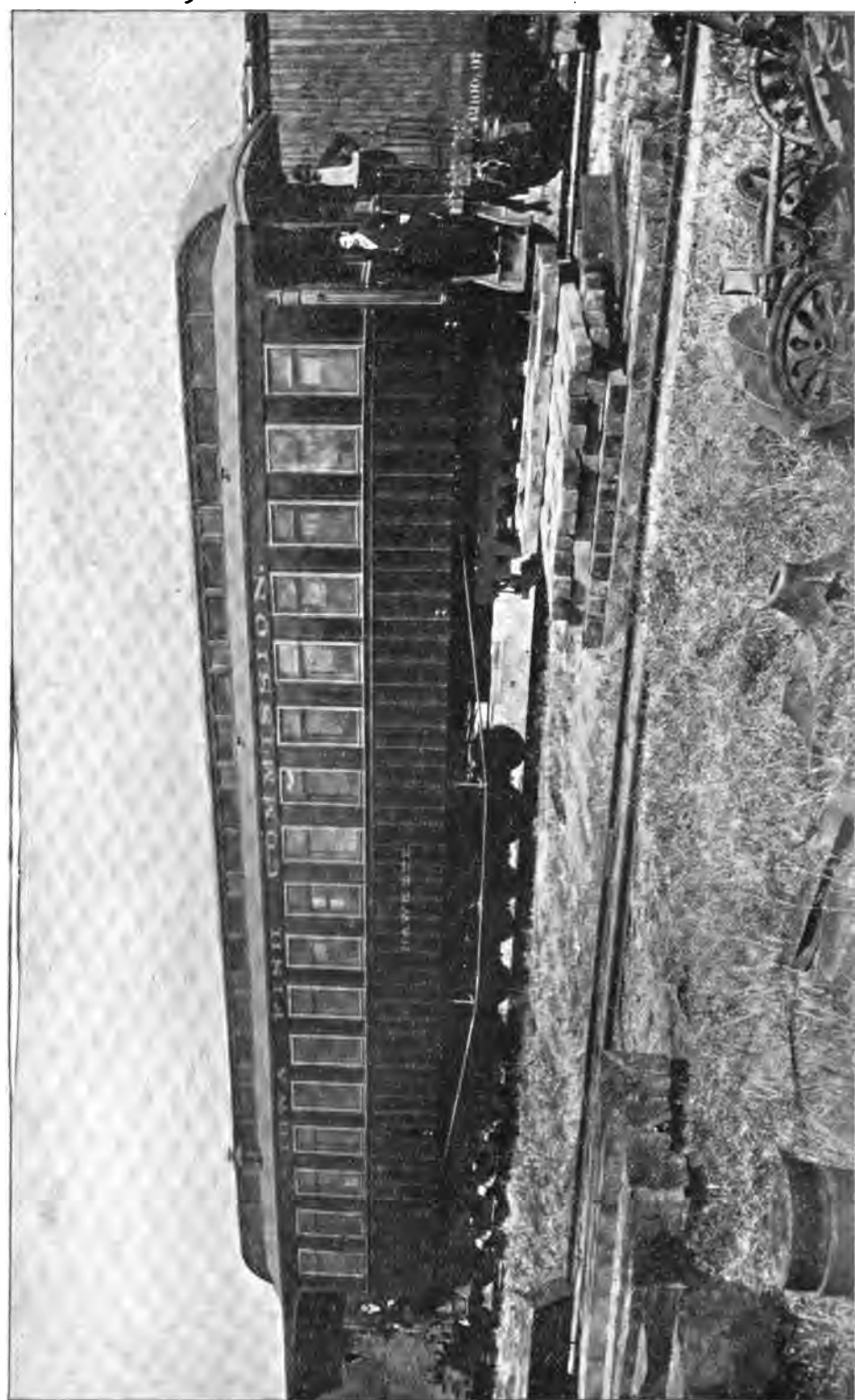
GEO. E. DELAVAN, WARDEN.

PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

DES MOINES:
V. R. CONAWAY, STATE PRINTER.
1900.







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REPORT.

To His Excellency, L. M. Shaw, Governor of Iowa:

DEAR SIR—In pursuance of the provision of section 2539, creating the office of fish and game warden, I submit for your consideration the thirteenth biennial report of the state fish commissioner, and the first biennial report of the game warden. During the past two years prosperity has smiled upon the work of distribution of the native food fish of the state. The species of fish taken for stocking the rivers and lakes of Iowa are the black bass, wall-eyed pike, crappie, silver bass, sunfish, and channel catfish. Although more than two million fish have been distributed, the demands on the commission are far in excess of its ability to supply, owing to the growing interest throughout the state. There is no better food than fish for both rich and poor.

The supply in the Mississippi bayous seem to be practically inexhaustible. The commission collects the best of these fish from near Sabula, where the state retaining ponds are located.

During the year 1897 the work was carried forward with difficulty by the use of only one retaining pond, which was not lined; and on account of the mud on both the bottom and the sides, handling the fish was seriously impeded. As the work advanced and the demands became more general, additional storage-room was necessary in 1898, when the two smaller ponds were constructed. One of these and a large one were planked in a substantial manner, the grounds neatly fenced, graded, and sodded, and cement walks laid down. The lots have also been beautified by the planting of ornamental trees, and altogether the place is attractive and the pride of the citizens of the beautiful little city in which it is located. The

ponds and grounds are under the supervision of Charles H. Swift, the warden's efficient deputy at that place.

It has been the aim of your warden to make the widest distribution of fish possible, and to reach those localities where the waters have not been previously stocked, but in some instances where applications have not been filled we did not consider the streams or ponds adapted for the life and health of the kind of fish to be distributed.

The retaining ponds at Sabula and the fish car are supplied with water free of charge from the famous artesian well at Sabula. No better water can be found for this purpose.

The gathering of the fish from the bayous has been done by two and three gangs of men, and with the assistance of teams and small boats the fish have been brought to the retaining ponds. This work could be augmented by the use of a launch to tow the fish boxes up and down the river. The state should own a boat of this kind, both as a means of simplifying the work and as a matter of economy.

ENFORCING THE FISH LAW, AND RECOMMENDATIONS.

The warden finds it much easier from year to year to enforce the fish and game laws of the state, especially since the stocking of our rivers and lakes by means of the car began. As the people see the increase of the fish they become interested in their preservation and render us aid in our efforts to enforce the law. Our greatest aids are the numerous fish and game protective societies which have been organized in many sections of the state, the membership of which societies is composed of enthusiastic sportsmen who frown upon the violation of the law and report to me regarding its infractions.

In many instances the deputy warden system inaugurated by the Twenty-seventh General Assembly is a failure, as many of the seventy-nine deputies whom I have appointed since the passage of the law, refuse to work for nothing. The law should be changed so that a deputy could receive a part, at least, of the fine to pay him for his trouble. Few men care to incur the enmity of others if compensation is not forthcoming from some quarter. As the law now is the informant's fee is seldom paid. To escape the jail penalty the worthless poacher usually pays the fine, but does not pay the informant's fee, because he is not obliged to under the law. The law should be amended to send the poacher to jail until both fine and costs are paid, or pay

the informant half of the imposed fine when it is paid. Not until an arrangement is made to pay the deputy a reasonable amount for his services will this system become effective. In several states the deputies draw a salary. In California twelve deputies are paid \$3 per day and expenses for time actually spent in the discharge of their duties. In Minnesota district deputies receive \$50 per month and expenses. The result is highly satisfactory in either case.

We recommend that the law be changed so as to make the killing of fish, by an explosive, a felony. Under the present law the offense is made a misdemeanor, and the punishment does not fit the crime. We know of instances where thousands of choice small fish have been killed in this inhuman manner in order that the perpetrators might secure a few large ones.

The fish and game warden and his deputies should be given police powers while in the discharge of their duties. Under the present law the attorney-general says they have no more power than a private citizen, and are liable to prosecution if they carry concealed weapons. Section 2539 of the code says: "The warden shall faithfully and impartially enforce obedience of this chapter," and yet practically leaves him and his aids stripped of the necessary power to do so. Several embarrassing instances have arisen in this particular. In Hamilton county a deputy, appointed under authority of section 2562, arrested a hard gang of law-breakers and succeeded in convicting them. They retaliated afterwards by securing the deputy's arrest for having a revolver in his possession. The justice before whom the case was tried regretted to impose a fine, but was obliged to, under the law. After the deputy's conviction it was impossible for sometime to secure another deputy in that county, as men did not care to endanger their lives without at least having an equal chance with the desperate characters they necessarily are obliged to deal with when making arrests of seiners and dynamiters. This serious defect should be speedily remedied.

There is not any law in Iowa that prevents the buying and selling within our own state of both fish and game taken or killed in another state. During the closed season of both fish and game it is very convenient for the dealer to say that the product he has on hand in abundance was taken in some of the bordering states, when nine times out of ten the fish and birds were illegally killed in Iowa. In some states it is no defense

for a dealer to make this claim. If there were a law to this effect in Iowa it would be the means of preserving our valuable fish and game interests in a great degree. Provision should also be made that it shall be no defense for any person to claim that game or fish found in his possession was killed or caught outside of this state.

Your warden believes that the game and fish of Iowa should be preserved for the citizens of Iowa, and to that end he is in favor of the enactment of a license law that will compel the people of other states, who come here for the purpose of killing the game, to pay a fee that might be determined by the legislature. In Illinois a similar law has been enacted, and outsiders are obliged to pay a license fee of \$10 in each county. North Dakota exacts a license fee of \$25 for the entire state, South Dakota \$10, Minnesota \$25, and Wisconsin \$25. Since these license laws were enacted in our neighboring states, Iowa has been hunted from one side to the other by nonresidents, principally from the states named, as there is no license fee to pay here. The counties in Iowa bordering on the Mississippi river have been greatly annoyed by hunters from Wisconsin and Illinois, who persist in coming here and killing for market game that rightfully belongs to the taxpayers of Iowa. Whenever a citizen of Iowa is detected hunting on the other side of the Mississippi he is promptly arrested and fined as the law there provides. A case was recently tried in which a citizen of Burlington was convicted and fined for killing a duck on the Illinois shore, the bird being shot on land owned by a sportsmen's club of Burlington. The duck was killed for the purpose of testing the constitutionality of the law, and Judge Kohlsaat, of Chicago, has declared the law constitutional and affirmed the decision of the lower court. Our people should have the same rights and privileges extended to them in this respect that the legislatures of other states give their constituents.

The warden is also in favor of a law which will prevent fishing near a fishway, and the penalty of infraction should be severe therefor. In some of the states the fine imposed is \$10 and costs for each fish so taken. In Minnesota the limit is one hundred feet. If the fish coming from a fishway are not protected, they can easily be taken in large numbers and the value of the fishway thus destroyed.

It has become apparent that the jurisdiction of the Iowa

fish law should be extended to the middle of the channel of the Mississippi river. Both Wisconsin and Illinois have laws prohibiting the seining of fish on their side of the channel, and the result is that the Iowa side of the river is seined constantly by market fishermen. The Mississippi river is the source of supply for all of Iowa's inland waters, and if the fish are allowed to be taken there without hindrance the supply for our rivers and lakes is necessarily cut short. In all the cities and towns on both sides of the river are to be found large numbers of men with miles of seines constantly draining Iowa's side of the river of fish that would ascend the interior rivers if let alone. Near the town of Sabula, on the Iowa shore, is a pretty bay in the river that is a natural place for fish to gather in. This fall in one haul of a seine in this bay by fishermen from Savannah, Ill., 800 wall-eyed pike weighing from two to five pounds were taken, besides a large number of fish of other varieties. If other states bordering on the Mississippi can prohibit this wholesale destruction of fish, Iowa can and should do it at the earliest opportunity.

Every year millions of young game fish perish in the sloughs and bayous of the Mississippi along the Iowa shore. These fish are hatched there during the time of high water, and when the water recedes in the fall they are left to die. These fish should be saved—seined out and placed in the river, and money spent in the work of rescuing such fish would be judiciously used. The importance of this work cannot be overestimated, for in one season the amount of food saved for the people would repay at least a hundred fold for the effort. The warden believes that \$2,000 should be appropriated for this work for the next biennial period.

MILLDAM OWNERS MUST CONSTRUCT FISHWAYS.

In the fish commissioner's last biennial report reference was made to a case instituted by the state against Beardsley Bros., of Oskaloosa, for the purpose of forcing the construction of a fishway in their dam over the river near that city. The case was tried before Judge Dewey, who declared the Iowa law relating to fishways unconstitutional and rendered a verdict for the defendants. The state at once appealed to the supreme court, and as the case is one that affects the entire water-power interests of Iowa, the decision of the higher court recently

given, which reverses the lower court in every particular, is appended below:

STATE v. BEARDSLEY.

(Supreme Court of Iowa, May 16, 1899.)

ATTORNEYS—AUTHORITY—EVIDENCE—CONSTITUTIONAL LAW—DAMS—
POLICE POWER—PRESCRIPTION—NUISANCE.

1. Code 1873, paragraph 214, which provides that the court may, on motion of either party to an action, require the attorney for an adverse party to produce or prove the authority under which he appears, and until he does so, may stay all proceedings by him in behalf of those for whom he assumes to act, provides the exclusive method of testing the authority of the attorneys.

2. An allegation in an answer setting up a lack of authority on the part of the attorneys to commence the action is an affirmative defense, and is denied by operation of law, and the action would not abate until such want of authority was proven.

3. Laws of the Seventeenth General Assembly, chapter 188, which provides that the owner or owners of any dam or obstruction across any watercourse in this state shall within a reasonable time construct and maintain over or across said dam a fishway which will afford free passage for fish up and down and through said watercourse, and that any dam not so provided within a reasonable time shall be abated as a public nuisance, is not, as to one who owns both sides of a stream, and who has maintained a dam there for twenty-three years, unconstitutional, as depriving him of his property without due process of law.

4. Such act does not constitute a taking of private property for public use without just compensation.

5. The requirement by the legislature that dams across streams shall be so constructed as not to interfere with the passage of fish is a legitimate exercise of the police power of the state.

6. It is the province of the legislature, within the fundamental limitations upon its authority, to prescribe what shall constitute a nuisance.

7. By maintaining a dam for twenty years the owner does not acquire a prescriptive right as against the power of the state to compel erection of fishways.

Appeal from district court, Mahaska county, A. R. Dewey, Judge.

The defendant is the owner of about 100 acres of land, through which flows Skunk river. The defendant is now, and has been for some years, maintaining a dam across said river, on his premises, in a way to obstruct the free passage of fish up and down said river; and he has neglected, and still neglects and refuses, to construct and maintain over or across said dam a fishway for the passage up and down said river. This action is brought to have a dam adjudged a nuisance and have the same abated. The issues present several propositions, which will be noticed in the proper connection. The district court gave judgment for defendant, and the state appealed. Reversed.

Milton Remley, attorney-general, James Carroll, B. W. Preston and J. F. & W. R. Lacey, for the state; J. C. Blanchard, for appellee.

GRANGER, J.—1. The action was commenced in September, 1895, by the filing of the petition, with "Carroll, Lacey, and Preston, attorneys for plaintiff." The answer was filed October 1, 1895, and one division of it is that "the parties commencing this action have no right or authority to commence or prosecute this action, that they have no power or authority to represent the state, and that this action can only be prosecuted by the attorney-general or other proper state officers." The point is now urged in argument. It is not doubted that the state is the proper party; the controversy being as to the attorneys who first appeared for the state,—the thought being that the attorneys are the parties prosecuting. The question, it seems to us, must turn on whether the attorneys have authority to appear, as such, for the state; and whether they have such authority or not is a question of fact, for, as the averment is in the answer, in the nature of an affirmative defense or plea, it is denied by operation of law, and, before the suit could be abated for want of such authority, the fact must be made to appear, and no further attention seems to have been given the question. We must say, however, that it is doubtful if a suit could be abated, or even delayed, by such a presentation of the question of the authority of the attorneys to bring suit in the name of a party, because of a specific provision of the code of 1873, under the provisions of which this proceeding was commenced and tried. Section 214 of that code is as follows: "The court may, on motion for either party and on the showing of reasonable grounds therefor, require the attorney for the adverse party, or for any one of the several adverse parties, to produce, or prove by his own oath or otherwise, the authority under which he appears, and, until he does so, may still all proceedings by him on behalf of the parties for whom he assumes to appear." We think this statute is designed as the exclusive method of testing the authority of attorneys to appear in behalf of clients. It is also to be said that the attorney-general afterwards appeared in the case and is now of counsel for the state.

2. The following are provisions of chapter 188, laws Seventeenth General Assembly: "The owner or owners of any dam or obstruction across any river or stream, creek, pond, lake, or watercourse, in this state, shall, within a reasonable time, erect, construct, and maintain, over or across said dam or obstruction, a fishway of suitable capacity and facility to afford a free passage for fish up and down and through said watercourse when the water of said stream is running over the dam." "Any dam or obstruction mentioned in section 1 of this act, not provided with such a fishway within a reasonable time after the taking effect of this act, is hereby declared a nuisance, and may be abated accordingly." It is said by appellees that the defendant and his grantors have owned the land and maintained the dam for more than twenty-three years, and that the act above quoted is unconstitutional, in that it deprives the defendant of his property without process of law, and also because private property is taken for public use without just compensation. The question of the constitutionality of such laws is not a new one in this country. It may be conceded that the authorities on the question are not without conflict. Whether or not the law contravenes either provision of the constitution depends on whether the acquisition of rights by the purchase of the land and the erection of the dam was without a reservation by the public to legislate in respect to the preserva-

tion of fish by the passage of such a law. The rights of the riparian owner on unnavigable streams is a subject that has been much considered by the courts, and in some respects the conclusions are harmonious, such as to the use of the water, and the exclusive right to take fish from the stream on his own land; it being the law that such an owner, if owning on both sides, as title to the banks and the bed of the stream, and, if the stream is the boundary, then to the center thread of the stream. It is well-settled law that one riparian owner has not the right to so use the stream as to unreasonably deprive other riparian owners of rights common to all. It has ever been the law that riparian owners, when taking title from the public, do so with limitations in the public interests. They do not own the stream, but, by virtue of ownership of the soil, have the right to use the water passing over or through it, with limitations on such use. These limitations are to protect what have always been regarded as public rights or interests. Streams flowing through the country are not alone the heritage of riparian owners. They pass over and along our public highways, and through our cities and towns, where the general public have access to them, and have rights in relation thereto that no one would think of questioning. These rights so pertain to the public health, convenience, and comfort that the cause of their loss by personal interference would amount to a public nuisance. Fish and game are so related to the public welfare that they have, time out of mind, been the subjects of legal control, and their preservation has been very generally a matter of legislative concern. Chapter 15 of title 12 of our present code is a practical illustration of legislative thought on the subjects of fish and game,—as to the public interest therein and their utility. These laws, if enforced, are of manifest abridgment of otherwise legal rights of the owners of the soil in taking fish and game thereon, and, except perhaps as to specific details, they meet with universal approval. These considerations are valuable in considering the inherent right of the owner of the soil to so use it as to impair such a public interest. In *Com. v. Essex Co.*, 13 Gray, 247, Chief Justice Shaw used this language: "It seems to be well settled that the obstruction of the passage of the annual migratory fish through the waters and streams of the commonwealth is not an indictable offense at common law; but the right to have these fish pass up the rivers and streams, to the headwaters thereof, is a public right, and subject to regulation by the legislature." Because of the court from which it emanates, we copy an opinion by the supreme court of the United States in *Holyoke Co. v. Lyman*, 15 Wall. 500, as follows: "Rivers though not navigable even for boats or rafts, and even smaller streams of water, may be, and often are, regarded as public rights, subject to legislative control, as the means for creating power for operating mills and machinery, or as the source for furnishing a valuable supply of fish, suitable for food and sustenance. Such water-power is everywhere regarded as a public right, and fisheries of the kind, even in waters not navigable, are also so far public rights that the legislature of the state may ordain and establish regulations to prevent obstructions to the passage of the fish, and to promote the usual and uninterrupted enjoyment of the right by the riparian owners. Proprietors of the kind, if they own both banks of the watercourse, and the whole soil over which the water of the stream flows, may erect dams extending from bank to bank to

create power to operate mills and machinery, subject to certain limitations and conditions, and may also claim the exclusive right of fishery within their territorial limits, subject to such regulations as the legislature may from time to time ordain and establish. Persons owning the whole of the soil constituting the bed and banks of the stream are entitled to the whole use and profits of the water opposite their land, whether the water is used as power to operate mills and machinery or as a fishery, subject to the implied conditions that they shall so use their own right as not to injure the concomitant right of another riparian owner, and to such regulations as the legislature of the state shall prescribe."

In *Weller v. Snover*, 42 N. J., Law, 341, the same quotation was made from Chief Justice Shaw, and the case of *Holyoke Co. v. Lyman* is cited, and the syllabus states: "The state has the right, by legislation, to protect fish in rivers and streams not navigable." As early as 1808 the supreme court of Massachusetts announced the law that: "Every owner of a watermill or dam holds it on the condition, or perhaps under the limitation, that a sufficient and reasonable passageway shall be allowed for the fish. This limitation, being for the benefit of the public, is not extinguished by any inattention or neglect in compelling the owner to comply with it." *Inhabitants of Stoughton v. Baker*, 4 Mass., 522. The case of *Parker v. People*, 111 Ill., 581, is a somewhat full consideration of the question, with an elaborate dissenting opinion by one of the justices; so that the case may be said to have received careful consideration. The statute of that state is so nearly like ours as to make the case entirely applicable. In that case the unconstitutionality of the law was urged upon the same grounds as in this case. The case has a somewhat more extended quotation from *Inhabitants of Stoughton v. Baker* than we have made, and gives full sanction to the rule, upon a review of the English as well as the American authorities. In 1822, in *Hooker v. Cummings*, 20 Johns, 90, the supreme court of New York said: "The legislature have confessedly the right of regulating of fish in private rivers, and do every year pass laws for that purpose, as to rivers not navigable in any sense, and which are unquestionably private property." State of Nebraska has a like law, and the question of its constitutionality arose in *West Point Water Power & Lund Imp. Co. v. State*, 49 Neb., 218, 66 N. W., 6; and its validity was sustained, with a citation to the above authority and others. It should be said that the latter case, as authority, is questioned, because on rehearing the case was reversed, while on the first hearing it was affirmed. This is to be said of the case: On the hearing the case was reversed, and the law held unconstitutional, because of a noncompliance with the constitutional requirement as to what should be expressed in the title of the act, which question was not presented on the former hearing. Both opinions are published in the official report, and there is no reconsideration of the questions determined on the first hearing. We are unwilling to believe the court would permit the case to be reported as it is, had there ever been a serious doubt of the correctness of its conclusions on the first hearing; so that, whatever may be the status of the case as to the conclusiveness of the holdings, it is evidently an expression of the judgment of the court on the questions considered. In this same connection we may further say that some of the cases cited—such as *Holyoke Co. v. Lyman*, *West Point Water Power & Land Imp. Co. v. State*, and others—are thought

to be without force, because the dams were across navigable streams. It is true that they were; the erection of dams being under a grant by the state, with no reservation in behalf of the public as to fishways. The law seems to be as definitely settled in favor of the public to protect fish, and provide for their passage along the streams, as well in unnavigable as in navigable waters. In both instances the power to regulate is based on public interests, and it is not easy to see wherein the public may not as well assert its reserve power for such a regulation where the title has passed to the banks and bed of the stream, without express reservation, as where there is an express grant for the construction of the dam across a stream without reservation. The limitation of rights or reservation of power arises by implication of law affecting the grant in either case. But, aside from this, the courts of the country, from its very highest, have regarded these cases as so akin in principle that, almost if not entirely without exception, their conclusions have been made to rest, in cases where the dam has been constructed or maintained by grant, upon the rules applicable as well to unnavigable streams. The cases are valuable as indicating the trend of legal thought on the subject, even if not authoritative in the way of adjudications—in which view, however, we are not disposed to concur. Were we to hold the present law unconstitutional, so as to open the way for a riparian owner whose land is on both sides of a stream, or two abutting owners, to, by a dam or other obstruction, prevent the passage of fish up the stream, and thus deprive other riparian owners and the public of privileges as ancient as civilized history, the way would be well opened for innovations and surprises as to rights long enjoyed and of undoubted security. The streams and lakes are the natural abiding places for the fish. In them they cast their spawn and multiply their species. They constitute an important and valuable article of diet for the rich and poor, and, with the ways open that nature has provided, they are accessible to both. If the lowest riparian owner of a stream may legally block the way of their migration, the consequences to result to the thousands are not readily imaginable. The law that would permit it would be the entering wedge by which the few would profit at the expense of the many. Before we sanction such a rule, its existence should clearly appear.

3. It is urged that, because of the dam being constructed thirty years before the enactment of the law, defendant has a right to maintain it by prescription. The clear weight of authority is against such a right. The cases already cited are quite decisive of this question. The strongest case we have noticed in support of appellee's claim is *Woolever v. Stewart*, 36 Ohio St., 146. It holds to the doctrine that, as between riparian owners, or the maintenance of the dam for twenty-one years, under certain conditions to make the holding adverse, a prescriptive right exists that the legislature may not disturb. The holding is made to depend clearly on a rule that there is no implied limitation upon the owner of the soil as to his right to obstruct the passage of fish along the stream, in which respect the case stands opposed to what seems to us the clear weight of authority and reason. In Maine, the supreme court, speaking to this question, said: "No individual can prescribe against this right which is held to belong to the public." *Cottrill v. Myrick*, 12 Me., 222. In *West Point Water Power & Land Imp. Co. v. State*, *supra*, it is said: "Regarding the plaintiffs in error's reliance

upon a prescriptive right to maintain its dam without making provision for the passage of fish, and upon the fact that the construction of the dam was authorized by the territorial legislature, it is sufficient that the reserve powers of the state, including the right to conserve and promote the public welfare at the expense of private interests, denominated the 'police power,' is inalienable, and cannot be surrendered or bartered away by the legislature." This case involves no question of a surrender of such rights by the legislature, and we quote the language only as to its force upon such rights being lost by prescription. The authorities make the police power of the state the basis of legislative authority to prescribe regulations as to fish and its streams; and in *Stone v. Mississippi*, 101 U. S., 814, it is said that, "all agree that the legislature cannot bargain away the police power of the state." This being true, how could the legislature, beyond its power of retraction, exempt the dam owner from obligations to maintain passageways for fish, to the detriment of those conditions which it is the office of the police power of the state to conserve and protect? If this could not be, how could it be that a rule of prescription would operate to suspend such a power? It would seem that all reason, if not all authority, is against such a rule. It is thought that it is not competent for the legislature to declare the dam a nuisance, and a reason given is because it is "not a nuisance." The statement can only be of force by saying that a nuisance is legally so defined, upon other and higher authority, that the legislature may not provide that such an obstruction against the public interests shall constitute a nuisance. Our understanding is that it is the province of the legislature to prescribe what shall constitute a nuisance, within the fundamental limitations upon its authority. One definition of a nuisance is the unlawful use of one's own property, working an injury to a right of another or of the public, and producing such inconvenience, discomfort, or hurt that the law will presume a consequent damage. Woods, Nuis. 1; 16 Am. & Eng. Enc. Law, 923. The legislature has kept itself within the settled rule; for that the act of obstructing the passage of fish, against individual and public interests, would raise a legal presumption of damage is too clear a proposition to be debatable. We need not consider other questions, and the judgment will stand reversed.

Since this case was decided several owners of dams have voluntarily built fishways. Among these are the owners of the two dams at Waterloo, and of those at Cedar Falls, Waverly, Nashua, Independence, Hazelton, and Canton.

BONAPARTE DAM.

Regularly, for a number of terms of the Iowa legislature, a bill has been presented asking for \$25,000 to pay the Meek Bros., of Bonaparte, for the dam across the Des Moines river at that place, that the dam might be destroyed and the fish from the Mississippi river ascend the stream without hindrance. This dam is located in Van Buren county, and is the first dam on the Des Moines river north of the Mississippi. At nearly all times of the year, but more especially in the spring, large

numbers of fish come up the river as far as this dam and can get no farther, as the dam completely obstructs their passage beyond this point. By the existence of this dam thousands of people residing on the Des Moines river north of Bonaparte are deprived of their rightful supply of fish, and they desire that a fishway be placed in the dam. At the request of a large number of these people a suit was begun against the owners of this dam (after the above sweeping decision of the supreme court) to compel them to construct a fishway. The case was tried at Bloomfield December 19, 1899, judgment being rendered for defendants. The state has appealed.

IN REGARD TO TRAPPING AND KILLING GAME BIRDS.

The last two years have been excellent for hunting feathered game. Both prairie chickens and quail have been found quite plentiful, but considerable poaching has been done in localities where public sentiment is against the enforcement of the law.

Prior to 1898 no person was especially empowered to look after the preservation of the valuable game interests of the state, and in some of the western counties trapping and shipping had been engaged in regularly every winter. On one farm in Monona county your warden seized 180 chicken traps, and 138 chickens were seized at Cherokee enroute for Boston. The traps were destroyed and the poacher punished. The warden also seized half a dozen chicken traps near New Hampton with which the owner said he had been trying to catch crows. The feathers in the traps resembling prairie chicken feathers, the traps were legally destroyed. In Clay county winter prairie chicken poachers array themselves in white suits of clothes when hunting. On a bright day when the snow is on the ground the poacher can work himself slowly but surely close enough to a flock to cause fearful havoc with his repeating Winchester before the birds can get out of range. Three prairie chickens taken from the person of one poacher who was hunting in this manner, cost him about \$70.

Under the protection of the law passed by the legislature six years ago, quail have increased so that it was not unusual last fall to find flocks of from twenty to thirty birds. The last legislature, however, changed the open season on quail to November 1st to December 31st. This was a mistake, for as soon as the snow came the birds could be easily tracked and killed in large numbers by the market and pot hunters. If the

law is not changed, making the open season from October 1st to November 30th, there will soon not be any quail to protect. Woodcock and partridge have become very scarce.

If the fashion of decorating bonnets and hats with the stuffed skins of song birds could be abandoned, the lives of thousands of Iowa's bright-plumaged birds would be saved. Several species of these beautiful birds have become nearly extinct on account of the quite general slaughter of them for that purpose.

GLUCOSE CASE.

In the fall of 1897 large numbers of fish died in the Iowa river south of Marshalltown, and floated down to the city of Tama. The loss included fish of all kinds and sizes, and there were thousands of them. As a means of protecting the health of the community the city authorities of Tama employed men for nearly a week to gather these fish together and bury them. Upon investigation as to the cause of this general destruction, the fact was ascertained that the waters in the river had been polluted by the glucose factory of Marshalltown depositing its refuse matter in the river. After an analysis of the water, in which certain acids were discovered, proceedings were begun against the proprietors of the works and they were convicted and heavily fined. This was the second offense. The case has been appealed.

THE FISH CAR AN EDUCATOR.

The warden finds that the fish car creates a healthy sentiment in favor of the enforcement of the law relating to the protection of fish. Wherever a load of fish is deposited, the people at once take measures to secure their protection, and either a deputy is at once appointed or a rod club is organized. In this manner of distribution the people become interested in the work of preservation and greatly aid us in our efforts at enforcement. There is no way in which the commission can increase the supply of both fish and game in the state except by the exercise of constant vigilance in the detection and punishment of the lawless element.

BENEFITS DERIVED FROM STOCKING THE INLAND WATERS OF THE STATE.

Desiring to ascertain what the result has been from stocking the lakes and rivers of the state by means of the fish car



The above illustration shows thousands of dead fish floating down stream the next day after the contents of the vats were emptied in the river.



Dead fish piled up at Tama City.

during 1897, the warden last July addressed a letter to some person residing in the locality where the fish had been taken, asking if any benefit was apparent from the depositing of the fish. The following answers were received:

STORM LAKE, Iowa, August 19, 1899.

Hon. George E. Delavan, Estherville, Iowa:

MY DEAR SIR—Regarding the work of the fish commissioner at this place, I wish to state that our people appreciate very highly the work that has been done here, not only in enforcing the law and protecting the fish in the lake, but also in restocking the lake. The fishing has never been so good in the lake as during the past two seasons, and this is chiefly due to the work of the fish commission. Bring us another carload is all we ask.

Yours very truly,

F. F. FAVILLE.

WATERLOO, July 20, 1899.

The oldest inhabitant cannot remember when fish were so plentiful in the Cedar River as now. The water is alive with them. In eddies where the fish rest after a battle with the swift current, they can be seen by the hundreds. The upper dam will prove an effectual barrier, however, and it is expected that large catches will be made between the two dams when the river clears up.—Correspondent of the Dubuque Globe.

MANCHESTER, Iowa, August 31, 1899.

Hon. G. E. Delavan, Estherville, Iowa:

SIR—Your kind letter of July 12th came to hand in due time. I know the stocking of the Maquoketa river at this place has done much good. The crappie, a fish we never caught here before, are being caught, and the river is full of young ones from one to two and one-half inches long. A few pickerel have been caught, but few compared with the crappie. Let the good work go on is the verdict of all in this part of the state.

Yours truly,

GEORGE W. STORY.

GREENE, Iowa, October 28, 1899.

G. E. Delavan, State Fish and Game Warden, Estherville, Iowa:

DEAR SIR—Your letter of inquiry is before me. The fishing in the Shell Rock river at this place has not been as good for years as it has been since you gave us the carload of fish. The catch has principally been black bass and pike, both excellent fish in every particular. I think you are doing a grand work with the small appropriation you have, which should be doubled, at least, by the next legislature.

With best wishes,

G. M. TYLER.

RICEVILLE, Iowa, August 28, 1899.

Hon. George E. Delavan, Estherville, Iowa:

I presume you are anxious to know if any good came from the planting of fish in the Wapsie river at this place. Yes, the fishing has been mate-

rially benefited. We are now catching fish of all the different varieties planted, which is appreciated by our people, who are grateful for your kind offices.

R. T. ST. JOHN.

OSAGE, Iowa, September 23, 1899.

Hon. George E. Delavan, Fish Commissioner, Estherville, Iowa:

DEAR SIR—Yours of July 12th is unanswered because I wanted to have a more definite knowledge of just how much benefit we derived from the fish you put into the Cedar river. We had no crappies or Oswego bass before your fish were put into the river, or channel catfish. Last week two Oswego bass were caught that weighed three and a half and four pounds each, one channel cat weighing two pounds, and six crappies—all captured by one man. The black bass and pickerel we can't tell much about. This we know to a certainty, that the best fishing is in the Osage electric light pond. Before you placed the fish in it this pond was the poorest one on the Cedar river in the county. There are four other mill ponds in the county in the Cedar river. The state can in no other way spend money to do as much good to the people as by granting ample appropriations to the state fish commission. We are only beginning to reap the benefits of your work. We would like another car of fish as soon as it is our turn, but do not wish to be greedy in the matter.

Yours truly,

A. C. TUPPER.

FORT DODGE, Iowa, October 23, 1899.

Mr. George E. Delavan:

DEAR SIR—We have had more fish and better fishing in the Des Moines river this year than for many seasons back. The fish laws are better observed than ever, and while we have not been able to stop all illegitimate fishing, yet we have prevented the most of it, and the sentiment of the community is steadily growing in favor of the observance of the law, and violators receive no sympathy as in times past.

Respectfully yours,

LISLE BURNAM.

COON RAPIDS, Iowa, July 17, 1899.

Hon. George E. Delavan, Estherville, Iowa:

DEAR SIR—To your letter in regard to the fishing in Coon river since the fish were put in by you last year, I will say that so far as I can learn the fishing has been very poor, due no doubt to the high water. We hope for good results from the car of fish, but so far we see nothing of them.

Yours very truly,

WARREN GARST.

CEDAR FALLS, Iowa, July 14, 1899.

George E. Delavan:

Yours at hand. The water in the river thus far this season has been so high and roily that a fair test of your question has not been had, but from what has been tried the stocking of the river by the car of fish you put in

has been of decided benefit, for the river above the dam had been nearly fished out, and as the fish could not get above the Waterloo dam or the one in the river at this place, we would have had no fish had it not been for those you put in last fall. Would say yes to your question. Give us another carload. Yours, etc ,

W. H. HURD.

FISHING IN SPIRIT LAKE.

On July 10, 1898, I caught sixty-seven wall-eyed pike before 10 o'clock A. M. One evening the fish did not bite very well, so I sank my three buckets of dead minnows, left my anchor out all night, with my cushion to the other end to mark the place. Next morning about 4 o'clock I went back, and I began from the very first to draw the pike out. I weighed my string of fish at noon in the presence of my wife and sister-in-law. It weighed 171 pounds. This is no fish story, for I am a preacher.

REV. E. J. BULGEN, L. D.

ARRESTS AND CONVICTIONS.

During the past two years there have been 482 arrests and convictions for violation of the fish and game laws of the state, and the fines paid in to the several county treasuries amounted to \$5,627. In some localities the poachers preferred to go to jail rather than pay the imposed fines.

THE FISH CAR.

The repairs on the fish car, "Hawkeye," have been small during the three years in which it has been in operation; \$100 probably would cover all the expense. During the present year, however, some more substantial repairs will be necessary. The total mileage made by the car during the past two seasons was about 14,000 miles. The warden has operated the car with only two assistants, a cook and one helper. Five men are usually employed on these cars.

TRANSPLANTING ADULT FISH.

We desire to refer to the work of transplanting the adult fish to inland waters. In the first place, the fish thus transferred by this commission are sufficiently large to protect themselves. In the second place, they are protected by the law

from November 1st to May 15th, during which time they will have spawned and replenished the waters in which they have been deposited a hundred fold. After this important event they are ready to be taken by the hook.

The demand upon this commission for fish has been so great that we are of the opinion that if the car ran every month of the year it would be impossible to grant all the requests.

ACKNOWLEDGMENTS.

We have received substantial aid from a few of the railways of the state, prominent among which are the Burlington, Cedar Rapids & Northern, the Chicago, Milwaukee & St. Paul, the Chicago, Burlington & Quincy and the Iowa Central. These companies have given the state fish car free transportation over their lines, which proved a saving of hundreds of dollars to the state. To the above companies we are under especial obligations.

The press of the state has greatly aided us in our work by upholding the law at all times, thus creating a sentiment for the right and calling the attention of the people to the valuable work being done by the commission.

We desire to thank the members of the legislature for the substantial and courteous treatment this branch of the state's institutions has received at their hands in the past, which included the enactment of wise laws for our guidance and the granting of a larger appropriation by \$3,000 than was ever granted before in the history of the commission.

DISTRIBUTION.

OKOBOJI.

Lake trout.....	120,000	Wall-eyed pike.....	10,000
Black bass.....	250,000	Rock bass.....	10,000
Crappies.....	175,000	Pickrel.....	10,000
Silver bass.....	50,000	Perch.....	25,000

SPIRIT LAKE.

Lake trout.....	120,000	Wall-eyed pike.....	25,000
Black bass.....	100,000	Rock bass.....	20,000
Crappies.....	125,000	Perch.....	10,000
Silver bass.....	50,000	Mixed varieties.....	25,000

BEED'S LAKE.

Black bass, crappies, sunfish and pickrel	100,000
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CLEAR LAKE.

Lake trout.....	112,000
Black bass, silver bass, crappies and sunfish	250,000

STORM LAKE.

Lake trout.....	112,000
Black bass, silver bass, crappies and sunfish	250,000

LOST ISLAND LAKE.

Lake trout.....	10,000
Black bass, crappies, pickerel and sunfish	125,000

WALL LAKE.

Black bass, crappies, pickerel and sunfish	125,000
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MEDIUM LAKE.

Black bass, crappies, sunfish and pickerel	125,000
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CRYSTAL LAKE.

Black bass, crappies, sunfish, channel catfish and pickerel	125,000
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"Q" RESERVOIR AT OSCEOLA.

Black bass, crappies, sunfish and pickerel	125,000
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CEDAR RIVER.

Black bass, crappies, wall-eyed pike, perch and sunfish	370,000
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DES MOINES RIVER.

Black bass, silver bass, crappies and sunfish	135,000
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ROCK CREEK.

Black bass, crappies and silver bass	5,000
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SHELL ROCK RIVER.

Black bass, crappies, sunfish and wall-eyed pike	125,000
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RACCOON RIVER.

Black bass, pickerel, perch and sunfish	125,000
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MAQUOKETA RIVER.

Black bass, crappies, catfish and perch	250,000
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IOWA RIVER.

Black bass, crappies, sunfish and pickerel	200,000
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TURKEY RIVER.

Black bass, crappies, sunfish and pickerel	125,000
Lake trout	60,000

CARP DISTRIBUTION.

Herman Rietveld.....	Pella	August Doje.....	Creston
H. J. Amandson.....	Roland	L. J. White.....	Marengo
C. M. Thomas.....	Searsboro	Isaac Porter.....	Prairie City
Theo. A. Anderson.....	Stanton	L. O. Imus.....	Mt. Ayr
Wm. Hartman.....	Whitten	F. M. Ford.....	Bagley
W. Lake.....	Cottage	Jas. P. Reilly.....	Montezuma
H. C. Baughman.....	Anita	C. L. Halcomb.....	Anamosa
L. P. Woods.....	Clarinda	Dr. H. Fischer.....	Pomeroy
A. S. White.....	Wesley	Matthew Templeton.....	Riceville
J. J. Hetlington.....	Menlo	J. A. Bennett.....	New Sharon
B. G. Beal.....	Mt. Ayr	L. J. White.....	Ladora
J. L. Boyer.....	Indianola	J. C. Caudle.....	New Sharon
John Bridger.....	Essex	Fd. Williams.....	Humeston
O. O. Fosse.....	Ruthven	G. Waterhouse.....	Farley
John Orr.....	Thornburg	C. Antenrieth.....	Creston
B. J. Sheppard.....	Caledonia	Burl G. Sheppard.....	Caledonia

GOLDFISH DISTRIBUTION.

Mrs. Lou Rummel.....	Dows	D. Chisden.....	Orleans
Dr. E. P. Perkins.....	Des Moines	E. Mills.....	Orleans
Senator Wm. McArthur.....	Burlington	Minnie Cron.....	Orleans
Mrs. Maynett.....	Grinnell	A. B. Palmer.....	Orleans
Mrs. Ella Robinson.....	Grinnell	Mrs. Brandon.....	Spirit Lake
Jas. L. Pitkin.....	Viola	Bertha Ankeny.....	Emmetsburg
Olive G. Reeve.....	Holstein	Maud Hudson.....	Estherville
Hon. G. W. Dickins.....	Hedrick	Mrs. Endersby.....	Estherville
C. E. Mann.....	Mason City	Rec. Stanberry.....	Mason City
W. B. Swafford.....	Hull	C. H. Slocum.....	Orient
Mrs. L. Du Bois.....	Ute	P. D. Wine.....	Aurelia
C. M. Manville.....	Ocheyedan	Chas. Seney.....	Mason City
Gov. F. D. Jackson.....	Des Moines	Mrs. Wm. Shreeve.....	Estherville
J. F. Johannes.....	Sibley	Mrs. T. A. Wilson.....	Buffalo Center
C. F. Fowler.....	Waterloo	E. A. Bundy.....	Aurelia
A. L. Bush.....	Emmettburg	Fleming Evans.....	Dows
Homer Atwood.....	Estherville	J. S. Gordon.....	Mason City
J. C. Watson.....	Inwood	M. C. Norden.....	Hartley
John Hammond.....	McGregor	J. M. Womeldorf.....	Hartley
A. J. White.....	Estherville	Mrs. Francis Peo.....	Morrison
A. M. Noblett.....	Fort Dodge	Mrs. P. R. Faragher.....	Sibley
J. B. Rendall.....	Ledyard	Lucy A. Clock.....	Hampton
Mrs. A. B. Lewis.....	Chester	Mrs. E. DeLong.....	Dows
Mrs. Wm. Francis.....	Cedar Rapids	Mrs. J. A. Landis.....	Greene
Conductor Mattison.....	Cedar Rapids	Mrs. J. S. Meade.....	Newell
Prof. White.....	Estherville	Mrs. J. M. Tregilgus.....	Sibley
Alva Barnes.....	Lovilia	C. H. Brown.....	Martelle
W. E. Knight.....	Estherville	Miss Jessie Smith.....	Laurens
Dr. C. C. Galloway.....	Estherville	C. F. Fowler (2d request).....	Waterloo
Prof. S. H. Adams.....	Bloomfield	H. M. Dayton.....	Colo

C. W. Cooledge.....	Grundy Center	W. H. Read.....	Cumberland
B, C. R. & N. agent....	Spirit Lake	J. C. Van Slyke.....	Cumberland
W. T. R. Humphrey.....	Clarion	Mrs. Emma B. Swain ..	Sibley
A. H. Male.....	Mason City	Fred Roberts	Estherville
B. Van Vliet.....	Mason City	Dr. Perkins (2d request).	Des Moines
Mrs. McDaniel.....	Des Moines	Mrs. D. P. Greeley	Red Oak
Fannie Shaffer.....	Des Moines	Mrs. George H. Vaugh.	Emmetsburg
Mr. Grout.....	Estherville	W. A. Dowell.....	Cumberland
T. G. Crozier.....	Cedar Rapids	Mabel Youngerman.....	Maple Hill
H. C. Kendall.....	Emmetsburg	Miss Alice Fox	New Sharon
Mrs. W. H. Parkin	West Bend	Mrs. H. E. Francisco....	Mason City
J. A. Smith.....	Spirit Lake	Senator W. F. Ellison....	Anamosa
Mrs. G. M. Stober.....	West Liberty	Mrs. J. B. Jewell.....	Estherville
Susan Day	Russell	D. H. Adams	Estherville
Mrs. C. Van Saunders.	Emmetsburg	Theron Morgan.....	Gurnsey
Mrs. J. S. Mead.....	Newell	Harriet Williams.....	Dows
Mrs. Mary Narey.....	Spirit Lake	J. A. Trunk	Dows
Hon. John Herriott....	Des Moines	Mrs. H. C. Nebb	Sibley
W. M. Smith.....	Sheldon	Mrs. C. Humphrey.....	Grand Junction
S. H. Smith.....	Sheldon	A. W. Nemseek.....	Emmetsburg
Mrs. G. J. Stewart.....	Chariton	Hon. Thos. Lambert.....	Sabula
Mrs. B. P. Birdsall.....	Clarion	J. S. Nye.....	Primghar
J. W. Todd.....	Sanborn	Mrs. John Barnhart ..	Estherville
Olaf Olson.....	Rock Rapids	Mrs. DeWitt Clinton ..	Mason City
W. D. Jenkin.....	Rock Rapids	Mrs. F. L. Stoddard.....	Carroll
J. L. Moffit.....	Wapello	D. H. Cross.....	Mason City
Mrs. Dr. Anderson	Estherville	Mrs. Will Bigby.....	Shellsburg
Graaf & Fletcher.....	Estherville	J. A. Bennett	New Sharon
Art Bradley.....	Estherville	Fred W. Mack.....	Newell
John Godden.....	Estherville	Alva Barnes	Lovilia
A. J. White	Estherville	W. T. R. Humphrey.....	Clarion
G. W. Coburn.....	Sibley	H. C. Kendall.....	Emmetsburg

ESTIMATE OF FUNDS NECESSARY FOR 1900-1.

For gathering fish at Sabula for restocking the rivers and lakes of the state.....	\$ 4,000
For protection, distribution and reproducing fish for the next two years	5,000
Payment of deputy fish and game wardens	3,000
For purchase of electric or gasoline launch	500
Assistant's salary	500
Payment of railway transportation for the fish car	2,000

I desire to call your attention to the fact that the amount is one-half as large as the Minnesota fish and game commission was granted last year, and about one-third as large as the amount the Wisconsin fish and game commission was voted by the last legislature of that state.

STATEMENT OF RECEIPTS AND EXPENDITURES.

The last biennial report gave an exhibit of receipts and expenditures from April, 1896, to April 1, 1898. At that time there was an unexpended balance, of the \$6,000 appropriated, of \$726.48, which was the only available resource the commission had for carrying the work forward for five months, from October, 1897, to April, 1898. At the present time, December 5th, there is an unexpended balance of the appropriation made by the last legislature of \$2,275.53, which will be used in the work until next April.

	EXPENDITURES.	RECEIPTS.
Amount appropriated by the Twenty-seventh General Assembly		\$ 9,000.00
April, 1898	\$ 1,109.30	
May, 1898	293.17	
June, 1898	414.30	
July, 1898	100.15	
August, 1898	170.52	
September, 1898	401.07	
October, 1898	605.68	
November, 1898	431.31	
December, 1898	166.46	
January, 1899	143.01	
February, 1899	88.08	
March, 1899	196.89	
April, 1899	188.18	
May, 1899	211.16	
June, 1899	212.48	
July, 1899	219.07	
August, 1899	246.73	
September, 1899	352.40	
October, 1899	728.57	
November, 1899	445.94	\$ 6,724.47
Balance		\$ 2,275.53

An itemized report is filed with the auditor of state.

Respectfully submitted,

G. E. DELAVAN,
Warden.

LIST OF FISH COMMISSIONERS.

U. S. COMMISSION OF FISH AND FISHERIES, WASHINGTON, D. C.

Commissioner, Geo. M. Bowers. Chief Clerk, Irving H. Dunlap.
 Assistant in charge of Division of Inquiry, respecting food fishes, Assistant in charge of Division of Fish Culture, W. deC. Ravenel.
 Hugh M. Smith, M. D.
 Assistant in charge of Division of Statistics and methods of the Fisheries, Chas. H. Townsend.

ALABAMA.

Col. D. Hudley, Madison. Chas. S. G. Doster, Prattville.

ARKANSAS.

W. B. Worthen, Little Rock.

CALIFORNIA.

Alex. T. Vogelsang, president, San Francisco. Charles B. Gould, Oakland.
 J. M. Morrison, Sacramento.

COLORADO.

I. S. Swan, Denver.

CONNECTICUT.

Abbott C. Collins, Hartford. J. A. Hill, Lyme (Bill Hill P. O.).
 Dr. G. H. Knight, Lakeville.

FLORIDA.

John Y. Detwiler, New Smyrna. John G. Ruge, Appalachicola.

ILLINOIS.

Natt H. Cohen, Urbana. S. P. Bartlett, Quincy.
 Aug. Lenke, Chicago.

INDIANA.

Zac Sweeney, Columbus.

KANSAS.

Dr. J. W. Shultz, Wichita.

MAINE.

L. T. Carleton, Augusta. Henry O. Stanley, Dixfield.
 Charles E. Oak, Caribou.

MARYLAND.

J. E. Tawes, East Shore, Crisfield. A. T. George, Baltimore.

MASSACHUSETTS.

E. A. Brackett, Winchester. I. C. Young, Wellfleet.
 E. D. Buffington, Worcester.

MICHIGAN.

Herschel Whittaker, Pres., Detroit. H. W. Davis, Grand Rapids.
F. B. Dickerson, Detroit. A. Ives, Jr., Detroit.
George D. Mussey, Detroit. Seymont Bower, Detroit.
C. S. Osborn, Sault Ste Marie.

MINNESOTA.

W. S. Timberlake, St. Paul. William Bird, Fairmount.
F. Von Baumbach, Alexandria. S. F. Fullerton, Duluth.
C. S. Benson, St. Cloud.

MISSOURI.

A. J. D. Berford, state game and William L. May, Fremont.
fish warden, Berfordville. Robert S. Oberfelder, Sydney.

NEW HAMPSHIRE.

N. Wentworth, Hudson Center. W. H. Shurtleff, Lancaster.
F. L. Hughes, Ashland.

NEW JERSEY.

George Pfeiffer, Jr., Camden. H. P. Frothingham, Mt. Arlington.
P. N. Paige, Summit. George L. Smith, Newark.

NEW YORK.

Barnett H. Davis, Palmyra. Hendrix S. Holden, Syracuse.
William R. Weed, Pottstown. Charles H. Babcock, Rochester.
Edward Thompson, Newport, L. I.

OHIO.

George Falloon, president, Athens. Albert Brewer, Tiffin.
J. W. Owens, Newark. J. C. Burnett, Sabina.
A. J. Hazlet, Bucyrus.

OREGON.

H. D. McGuire, Portland.

PENNSYLVANIA.

T. B. Stillwell, president, Scranton. H. C. Demuth, Lancaster.
James A. Dale, York. Louis Streuber, Erie.
D. P. Corwin, Sec'y, Pittsburg. James W. Correll, Easton.

PENNSYLVANIA GAME COMMISSION.

Coleman K. Sober, Lewisburg. Wm. M. Kennedy, Allegheny City.
E. B. Westfall, Williamsport. James H. Worden, Harrisburg.
I. A. Stearns, Wilkesbarre. Charles Haebner, Philadelphia.

RHODE ISLAND.

Wm. K. Southwick, Newport. Wm. P. Morton, Olneyville.
H. T. Root, Providence. C. W. Willard, Westerly.
A. D. Roberts, Woonsocket.

SOUTH CAROLINA.

A. W. Jones, Beaufort.

UTAH.

John Sharp, warden, Salt Lake City.

VERMONT.

John W. Titcomb, St. Johnsbury. Horace W. Bailey, Newbury.

VIRGINIA.

Dr. Frank Fletcher, Jenkins Bridge. Seth T. Miller, Hicks Wharf.
George B. Keezell, Keezellton. J. A. Curtis, Richmond.
Pembroke Pettit, Palmyra.

WASHINGTON.

A. C. Little, Tacoma.

ARIZONA TERRITORY.

Ed. Schwartz, Phoenix.

FOOD FISHES OF IOWA.

BY THE HON. TARLETON H. BEAN, OF THE U. S. FISH COMMISSION AND SMITHSONIAN INSTITUTE.

THE GREAT CATFISH.

This is the great fork-tailed cat, Mississippi cat, Florida cat, flannel-mouth cat, and great blue cat of various writers. It is also called mud cat in the St. John's river, Florida. The species is very variable, as we would expect from its wide distribution. In 1879 Prof. Spencer F. Baird received from Dr. Steedman, of St. Louis, a Mississippi river catfish weighing 150 pounds, and measuring five feet in length. The writer described this fish as a new species related to the great black catfish of the Mississippi valley, *Amiurus nigricans*. At the present time it is somewhat doubtful whether or not this is merely an overgrown individual of the species under consideration, and the matter must remain in doubt until smaller examples of *Amiurus ponderosus* have been obtained.

The great fork-tailed cat is a native of the Great Lakes and the Ohio and Mississippi valleys, and in the southern states its range extends southward to Florida; northward it ranges to Ontario. This catfish reaches a weight of 100 pounds or upward, and if it includes the giant form above referred to, we may place the maximum weight at over 150 pounds. Dr. Steedman was informed by an old fisherman that the heaviest one he had ever seen weighed 198 pounds, but it is doubtful if such large individuals are to be taken at the present time. In Lake Erie this species usually weighs from five to fifteen pounds, and the largest specimens reach forty pounds.

The habits of this fish are presumably about the same as in other species of the family. On account of the great size of the fish it naturally prefers lakes and large rivers. It is a bottom feeder and will take most any kind of bait. This species is wonderfully tenacious of life. It spawns in the spring and protects its young, which follow the parent fish in great schools. Dr. Theodore Gill has reviewed the subject of the catfish's care of their young in *Forest and Stream* of November 27, 1890.

This is a valued food species, although not a choice fish. In Lake Erie, according to the review of the fisheries of the Great Lakes recently published by the United States fish commission, the catfish rank next to whitefish in number of pounds taken.

THE SPOTTED CATFISH.

This species is variously styled the channel cat, white cat, silver cat, blue cat and spotted cat. It is found over a vast extent of country, comprising the Mississippi and Ohio valleys and the Great Lake region. In the eastern states it is absent from streams tributary to the Atlantic, but occurs from Vermont southward to Georgia, westward to Montana and southwestward to Mexico. The adults of this species are bluish-silvery and the young are spotted with olive. It is one of the handsomest of the family of catfishes, and an excellent food fish. Its introduction into waters in which it is not native has begun and the multiplication of the species is greatly to be desired.

The spotted cat grows to a length of three feet and a weight of twenty-five pounds. It is extremely variable in color and in number of fin rays, and has consequently been described under more than twenty different names. It is most abundant in large, clear streams. This species is less hardy than most of the other catfish.

THE CHANNEL CATFISH.

This is the white cat or channel cat, in Philadelphia distinguished as the Schuylkill cat.

The channel cat ranges from Pennsylvania to North Carolina, and is one of the most abundant of its family in the Potomac river. It is abundant in the Susquehanna and common in the Schuylkill.

This species reaches a length of two feet and a weight of five pounds. It is extremely variable with age. Old examples have the mouth so much wider than the young that they have been described as a distinct species. The big-mouthed cat of Cope is now considered to be the old form of the white cat. The habits of this species agree with those of other species already mentioned. The name channel cat suggests a favorite haunt of the fish. As a food fish it is highly prized.

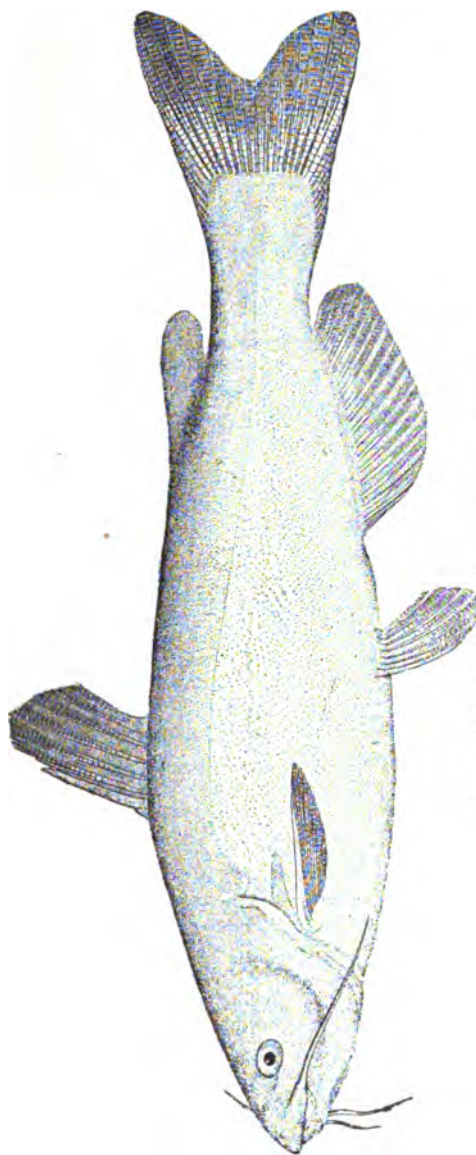
THE YELLOW CATFISH.

The yellow cat or chubby cat is found from the Great Lakes to Virginia and Texas. The species is not credited to the region east of the Alleghenies.

The length of the yellow sometimes reaches two feet, but averages much less. Nothing special is recorded about the habits of this species. It is most abundant in sluggish streams.

THE LONG-JAWED CATFISH.

The long-jawed catfish is found in the Great Lake region and westward to Manitoba. It is believed to be very nearly related to the common catfish, *A. nebulosus*, but its projecting lower jaw will serve to distinguish it.



THE CHANNEL CATFISH (*Ameiurus albidus*).

This character, however, we know by experience is not so satisfactory as it might be.

This catfish is occasionally taken in the Ohio river, but is more abundant in Lake Erie. The species reaches a length of eighteen inches and a weight of four pounds.

THE COMMON CATFISH.

This is known as the common catfish, bull-head, horn-pout, bull-pout and minster. This species has a wider distribution than the white cat, its range including New England and southward to South Carolina, west to Wisconsin and southwest to Texas.

From Jordan's Manual of the Vertebrates I quote Thoreau's account of the habits of this species: "The horned pout are dull and blundering fellows, fond of the mud, and growing best in weedy ponds and rivers without current. They stay near the bottom, moving slowly about with their barbels widely spread, watching for anything eatable. They will take any kind of bait, from an angle worm to a piece of tomato can without coquetry, and they seldom fail to swallow the hook. They are very tenacious of life, opening and shutting their mouths for half an hour after their heads have been cut off." They spawn in the spring, and the old fishes lead the young in great schools near the shore, seemingly caring for them as the hen for her chickens.

THE MUD CATFISH.

This is known under the name of mud cat, flat-head cat, Russian cat, yellow cat and goujon.

The mud cat in Pennsylvania is limited to the Ohio and its tributaries. It is abundant in the Mississippi valley in deep, sluggish waters, ranging westward to Iowa and southward to Georgia, but it is not found in tributaries to the Atlantic.

This is a very large species, reaching a weight of seventy-five pounds, and a maximum length of three feet. The mud cat prefers muddy bottoms and large, sluggish streams. It is a food fish of good qualities and is extensively used notwithstanding its ugliness.

THE STONE CATFISH.

The yellow-stone cat is found from Ontario to Virginia and in the Ohio valley. In the Mississippi region it extends west to Nebraska.

It inhabits the larger streams. The species has very little value as food on account of its small size. It seldom exceeds twelve inches in length, but it is a very good bait for black bass. The stone cats are much dreaded by fishermen because of the painful wounds sometimes produced by their pectoral spines. There is a minute pore in the axil of the pectoral which is the outlet of a noxious liquid secreted by a poison gland. When this poison is discharged into a wound it causes a very painful sore.

THE RED-MOUTHED BUFFALO FISH.

The red-mouthed buffalo fish, also known as the brown buffalo, high-backed buffalo, small-mouthed buffalo, sucker-mouthed buffalo and buffalo fish, is a common inhabitant of the Mississippi and Ohio valleys, but does not occur east of the Alleghenies.

This species reaches a length of two and one-half feet and a weight of fifteen pounds. It frequents large streams. Professor Forbes has been informed by fishermen that one or more species of buffalo fish have the "peculiar habit of whirling around in shallow water or plowing steadily along, with their heads buried in the mud and their tails occasionally showing above the surface. These operations have nothing to do with spawning, and it is likely that fishes thus engaged are burrowing for small mollusks and for mud-inhabiting larvæ." The food of this buffalo fish consists of aquatic plants, in the Illinois river chiefly duck weed and *ceratophyllum*. The animal food includes mollusks, insects and their larvæ and crustaceans. Worms are rarely found in their stomachs. The buffalo is not a choice fish and its flesh is filled with innumerable small bones, yet it is abundant and is eaten in very large quantities. These fish do not take the hook and are usually caught in seines.

THE QUILL BACK.

This is called the carp sucker, silver carp sucker, quill-back, skim-back, spear-fish, sail-fish and carp. As now limited, its range is stated to be from Pennsylvania to Virginia, and its center of abundance the region about Chesapeake Bay. Professor Cope also recognized it as occurring in the Allegheny river and generally throughout the Ohio valley.

The best account of the food of this fish is given by Prof. S. A. Forbes, who records the fish from the large rivers of Illinois and their principal tributaries, and from Lake Michigan and small lakes of northern Illinois. He found it abundant in the lakes and ponds of the river bottoms, and less common than other species of the carp suckers in running water. The species consumes less vegetation than the other fishes of its genus, and more mud is mingled with its food. It devours fewer of the large insect larvæ, and no pond snails.

"Mollusks made about one-fourth of the food—all the thin-shelled *Sphaerium*. Insects averaged about one-third, and *Entomostraca* made nearly one-fourth." No worms or polyzoans were observed, but occasionally protozoa were noticed. This species reaches a length of one foot.

THE BLACK HORSE.

This is known as the black horse, Missouri sucker, gourd-seed sucker and suckerel. It inhabits the Mississippi valley, and is not uncommon in the Ohio river.

The black horse reaches a length of two and one-half feet and a maximum weight of fifteen pounds. It is the best food fish of the sucker family.

The sexes differ in color; the males have the upper part jet black while the sides are black with coppery luster. The females are olivaceous with coppery shadings. The male has minute tubercles on the snout in the breeding season in spring. Dr. Kirtland noted a migration down stream at the approach of winter. The mouth of this sucker is small and the lips are covered with numerous tubercles.

THE COMMON SUCKER.

The common sucker, also known as the pale sucker, white sucker, grey sucker and brook sucker, styled by the Canadian French the *carpe blanche*, is the commonest member of its genus in waters east of the Rocky mountains. It is found from Canada to Florida and westward to Montana. Covering such a wide range of territory the species is naturally variable and has been described over and over again by many authorities under a great variety of names. The male of this sucker in spring has a faint rosy stripe along the middle of the side. The young are brownish in color and somewhat mottled and have a dark median band or a series of large blotches. The adults are light olive varying to paler and sometimes darker; sides silvery. The species reaches a length of twenty-two inches, and a weight of five pounds. It is a very common inhabitant of ponds and streams of the low lands, and a small race occurs in certain cold mountain streams of the Adirondack region, where it is dwarfed in size and changed in color, but does not differ in essential characters. Dr. Rothrock also obtained a mountain race of this sucker in Twin Lakes, Col., at an elevation of 9,500 feet above the sea level.

THE STONE TOTER.

The stone roller has a wide distribution and a wonderful variety of common names. Among them are hammer head, stone lugger, stone toter, crawl-a-bottom, hog mullet, mud sucker, hog sucker, banded sucker, large scaled sucker and black sucker.

The species grows very large, reaching a length of two feet. It delights in rapid streams of cold, clear water. Its habit is to rest quietly on the bottom, where its color protects it from observation. It is sometimes found in small schools. The spawning season is in spring and the young are found abundantly in small creeks as well as in the rivers. The food consists of insect larvæ and small shells, and it is especially fitted for securing its prey under stones in the rapids. As a food fish this sucker has little value.

THE CHUB SUCKER.

This is known as the chub sucker, sweet sucker, creek fish and mullet. It has a wide range, practically including all the waters of the United States east of the Rocky mountains. The chub sucker grows to a length of about one foot. It is very tenacious of life, and is a ready biter, but has

little value for food. The young, up to the length of several inches, have a very distinct black lateral band. They are often found in the shelter of water lilies and other aquatic plants close to brackish water.

THE STRIPED SUCKER.

The striped sucker, also called soft sucker, sand sucker and black-nosed sucker, is found in the Great Lakes and south to South Carolina and Texas.

The striped sucker grows to a length of eighteen inches. Old males have the head tuberculate in the breeding season in the spring. The species is very readily distinguished by the dark stripes along the sides produced by spots at the base of each scale. In the young of this sucker there is no lateral line, but in adults it is almost entire.

This species prefers clear, sluggish waters and grassy ponds. It readily adapts itself to life in the aquarium. It feeds almost entirely on mollusks, insects and insect larvæ. The species is not much esteemed as a food fish, although it is sold in large numbers.

THE RED HORSE.

The common red horse, also known as the white sucker, mullet and large-scaled sucker, is an extremely variable species occurring in the Great Lake region, Chesapeake Bay region, south to Georgia and Alabama, and west to Dakota. It is a large species and reaches a length of two feet.

The red horse inhabits clear waters and ascends small streams in May to spawn. As a food fish it ranks low, but the species is freely sold. Its food consists principally of mollusks and a small percentage of plants and insects. Minute crustaceans also form a small portion of its food.

THE STONE ROLLER.

The stone roller is likewise called stone totter, stone lugger and steel-back minnow. It is a fish of very wide distribution, ranging from western New York to North Carolina and through Ohio and Mississippi valleys, west to Minnesota and southwest to Texas. It is an extremely variable species, and everywhere common. It is, moreover, one of the most singular of American fishes, in having the air bladder surrounded by numerous turns of the long intestine. In this respect it is unique among fishes. The stone roller grows to a length of eight inches, but has no importance as food. It feeds upon aquatic plants. The young are hardy in the aquarium, where they feed upon conservæ and diatoms. The sexes are very unlike. The males in the breeding season have the head, and frequently the entire body, covered with large tubercles, and the upper half of the dorsal and anal fins fiery orange and with a dark cross-bar about the middle of these fins.

The species is rather sluggish, but when frightened its movements are very rapid. It is a bottom feeder.

THE RED-BELLIED DACE.

The red-bellied minnow or dace is found from Pennsylvania to Dakota and Tennessee. It is abundant in small streams, and is a strikingly beautiful fish. Along the sides are two blackish bands, one beginning above the eye and extending to the tail; another traverses the eye and follows the lateral line to the base of the caudal, where it ends in a black spot. The belly and the space between the bands are bright silvery, replaced by scarlet red in breeding males, which have the same color at the bases of the dorsal, caudal and anal fins.

In the height of the breeding season the fins are bright yellow, and the body is covered with small tubercles. It reaches a length of three inches, and is similar in its habits to the stone roller, with which it associates. It prefers clear streams, which have their origin in springs. As an aquarium fish this is scarcely excelled in beauty and hardiness, and as a bait for black bass it has few superiors.

THE SILVERY MINNOW.

The silvery minnow, or blunt jaw, according to the present interpretation of the species, occurs from New Jersey to South Carolina, west to Dakota, and southwest to Texas. In the Potomac river there is a large variety described by Girard as *H. regius*, which reaches a length of seven inches. This variety has the body deeper and the eye larger than in the western form. The largest individuals recorded were nine inches long.

This species spawns in the early spring, and is extensively used for food along with the *Notropis hudsonius*, spawn eater, or so-called smelt or gudgeon.

THE FAT-HEAD MINNOW.

The fat-head or black-head is an inhabitant of the Ohio valley and the Great Lake region west to Dakota and southwest to Texas. It is common in sluggish brooks, and instances have been known of its distribution by the action of cyclones. In Iowa it is common in tributaries of the Mississippi.

The fat-head grows to a length of two and one-half inches. The sexes differ in color, the females being olivaceous, while the males are covered with numerous large tubercles. The species has no value as food, but it is an interesting one for the aquarium. Its food consists of mud and algae, and it seems to prefer a muddy bottom.

THE SILVER FIN.

The silver fin ranges from western New York to Virginia and west to Minnesota and Arkansas. It is a common species and a variable one. It reaches a length of four inches. In Iowa it occurs in all the rivers and

creeks. It is one of our finest minnows for the aquarium, and is useful as food and bait for larger fishes.

THE ROUGH HEAD.

This is the common shiner, and has received the additional names of red-fin, dace and rough-head. The species is very widely distributed and is extremely variable, and as a consequence some geographical races have received distinct names. It extends from Maine to the Rocky mountains, but it is absent from the Carolinas and Texas. It grows to a length of eight inches.

The upper parts of this fish are steel blue, and the scales are dusky at the edge and base. The sides are silvery, overlaid with a gilt line; there is another gilt band along the back. The belly is silvery, except in spring males, in which it is a bright, rosy color. The male, in the breeding season, has the lower jaw and the top of the head and nape covered with small tubercles. In the breeding condition this is a very handsome species, although the females and the young lack the bright colors of the adult male. In Iowa the species is common and is best known under the name of red-fin. It has no value except as food and bait for more valuable fishes, especially the black bass and pike-perch. The flesh is very soft and cannot be kept long after death.

The shiner runs into small brooks, and is most abundant in eddies and other quiet portions of the streams.

THE SILVER-MOUTHED DACE.

This singular and interesting little fish is found in the Ohio and Mississippi valleys, and has recently been taken in the Mississippi and in west Florida. Northward it ranges to Michigan and west to Kansas.

This dace reaches a length of five inches, and it is one of the most remarkable of the members of the minnow family, because of the depression in the bones of the lower part of the head. The color is olivaceous, with silvery sides. There is a lateral chain of brown dots and a narrow vertebral line. This species has no importance except as food for black bass and other valuable species.

THE LONG-NOSE DACE.

The long-nose dace or Niagara gudgeon is found in New England and the middle states, and in the Great Lake region, in clear, cold water. It grows to a length of five inches. The sides are without the black lateral band, which is characteristic of the black-nosed species. The general color is olivaceous or dark green with the lower parts paler. The back is nearly black. Some of the scales are mottled with dark and olivaceous. The young have a trace of a dusty lateral band. The spring males have the fins, lips and cheeks crimson. Its movements are swift and powerful, and it is a very shapely little fish. As a bait for the black bass it is scarcely surpassed.

THE HORNED CHUB.

The horned chub is known in some localities as nigger chub, river chub and jerker; occasionally it is called horned dace or horny-head. The species ranges from Pennsylvania westward to Dakota and south to Alabama. It abounds in large rivers and is rarely seen in small brooks. This fish grows to a length of ten inches and is good for the table. As a bait for the black bass the young horned chub can not be excelled, because of its endurance on the hook.

THE HORNED DACE OR CHUB.

The common chub, creek chub, smaller fall fish or horned dace has a wider distribution than *S. bullaris*, but it does not grow quite so large, seldom exceeding one foot in length. Its range extends from New England to Missouri, southward to Georgia and Alabama. It is extremely common and ascends the small streams. It reaches four pounds in weight and is a fair food fish. This species is more characteristic of the small streams and clear ponds, and it takes the hook very freely.

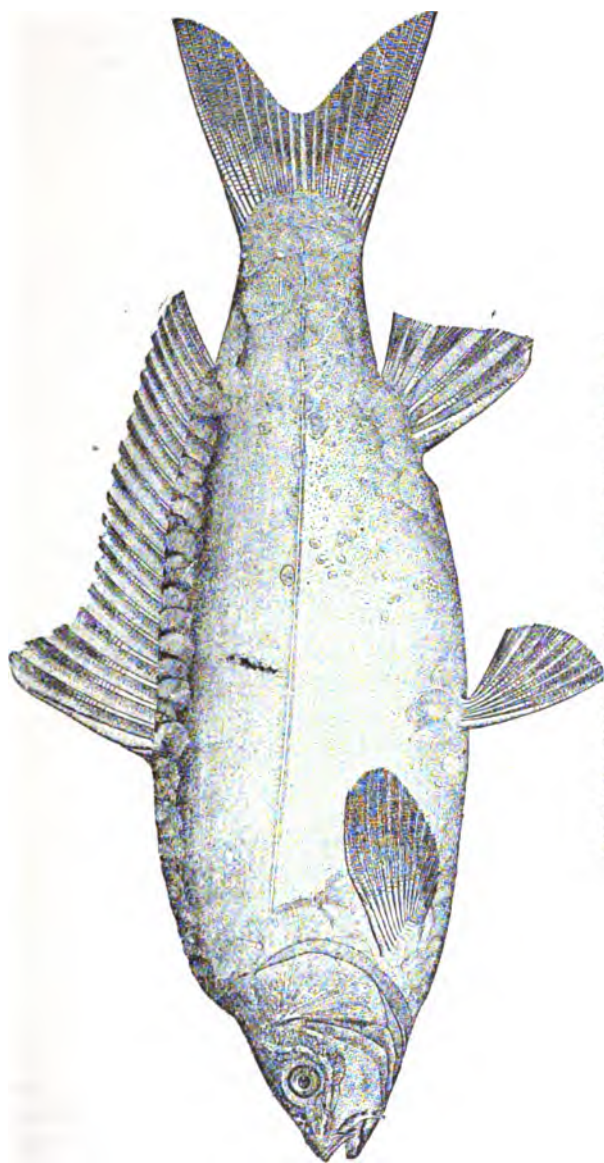
THE ROACH.

The roach, shiner, golden shiner or bream is one of the commonest fishes of Iowa. It is found from New England to Minnesota and southward. A variety of the roach replaces the common northern form from North Carolina to Texas.

The roach grows to a length of one foot and a weight of one and one-half pounds. It frequents sluggish waters, abounding in bayous and weedy ponds, as well as in tidal waters. According to Jordan its favorite shelter is the yellow pond lily. It may be readily distinguished by its shape, which resembles that of a shad, and by the very long anal fin, which contains from fourteen to seventeen rays. The colors of this fish are greenish above and the sides silvery with golden reflections. Fins usually yellowish; lower fins scarlet in breeding males. Although the roach is not a good food fish, it is taken by the hook in large numbers, and is a very useful species for bait.

THE CARP.

The carp is a native of Asia and has been introduced into Europe and America as a food fish, chiefly for pond culture; it thrives in all warm and temperate parts of the United States and reaches its best condition in open waters. In Texas it has grown to a length of twenty-three inches in eleven months after planting. The leather variety is most hardy for transportation. Mr. Hessel has taken the carp in the Black and Caspian seas; salt water seems not to be objectionable to it, and it will live in stagnant pools, although its flesh will be decidedly inferior in such waters. The carp



THE LEATHER CARP (*Cyprinus carpio* (var. *Coriaceous*).

hibernates in winter, except in warm latitudes, takes no food and does not grow; its increase in size in temperate latitudes occurs only from May to August.

The spawning season begins in May and continues in some localities until August. A carp weighing four to five pounds, according to Mr. Hessel, yields from 400,000 to 500,000 eggs; the scale carp contains rather more than the other varieties. During the spawning the fish frequently rise to the surface, the female accompanied by two or three males. The female drops the eggs at intervals during a period of some days or weeks in shallow water on aquatic plants.

The eggs adhere in lumps to plants, twigs and stones. The hatching period varies from twelve to sixteen days.

According to Hessel the average weight of a carp at three years is from three to three and one-fourth pounds; with abundance of food it will increase more rapidly in weight. The carp continues to add to its circumference until its thirty-fifth year, and in the southern parts of Europe, Mr. Hessel has seen individuals weighing forty pounds and measuring three and one-half feet in length and two and three-fourths feet in circumference. A carp weighing sixty-seven pounds and with scales two and one-half inches in diameter was killed in the Danube in 1853. There is a record of a giant specimen of ninety pounds from Lake Zug in Switzerland. Examples weighing twenty-four pounds have been caught recently in the Potomac river at Washington, D. C.

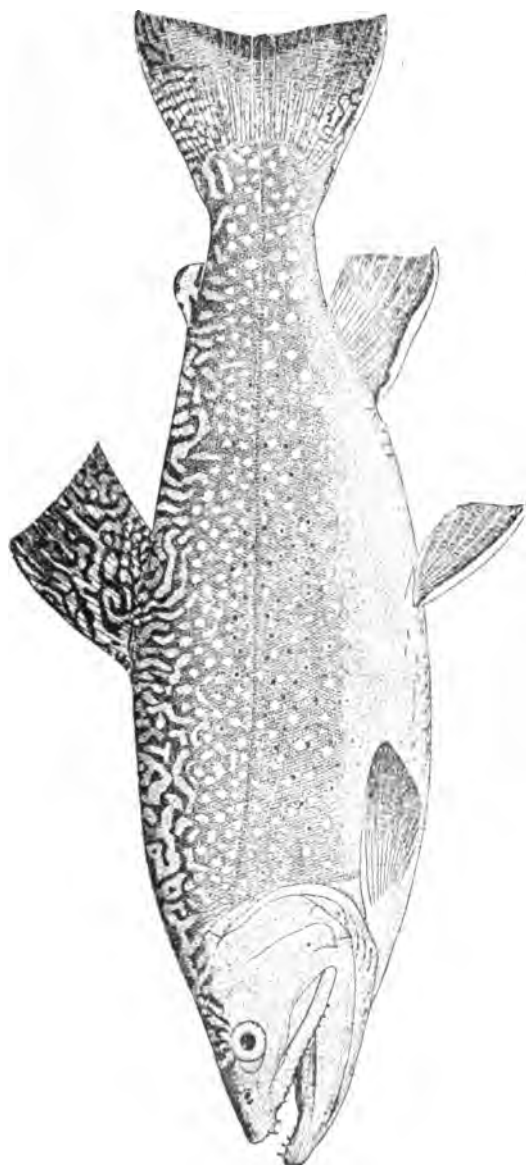
The carp lives principally on vegetable food, preferably the seeds of water plants, such as the water lilies, wild rice and water oats. It will eat lettuce, cabbage, soaked barley, wheat, rice, corn, insects and their larvæ, worms and meats of various kinds. It can be readily caught with dough, grains of barley or wheat, worms, maggots, wasp larvæ, and sometimes with pieces of beef or fish.

THE BROOK TROUT.

The brook or speckled trout of the east is indigenous to the region east of the Alleghenies and the Great Lake region, extending from Georgia on the south to Labrador on the north. The distribution of this trout has been wonderfully extended by artificial introduction, as it has always been a favorite with fish culturists. It is now to be found thriving in many of the western states and territories, and is particularly thrifty in Iowa, Nebraska, Colorado, Nevada and California. It has also been sent to Mexico and to European countries.

The average brook trout seldom exceeds seven or eight inches in length and smaller individuals are much more abundant and require legal protection. In the northeastern part of its habitat the brook trout grows much larger, specimens weighing from three to six pounds being not uncommon, and in one of the rangely lakes an individual weighing eleven pounds is recorded; while Seth Green took a twelve pound specimen in the Sault Ste Marie, and Hallock mentions one which was said to weigh seventeen pounds.

The brook trout does not flourish in water warmer than 68 degrees, and



THE SPECKLED TROUT (*Salvelinus fontinalis*).

prefers a temperature of about 50 degrees. It is an inhabitant of the cold, clear mountain streams, and will leave a region which becomes polluted by mill refuse and other hurtful substances. In the Long Island region and around Cape Cod where the brook trout has free access to salt water, it has the habit of going to sea in the fall and remaining during the winter. It then grows rapidly and becomes a much more beautiful fish than many which live exclusively in fresh water. In hot weather when the temperature of the streams becomes too high and lakes are accessible, trout seek the deep parts of the lakes and the vicinity of cold springs. In streams they are to be found in deep pools or in channels. They feed in spring or early summer among the rapids upon insects and small crustaceans.

The brook trout is the nest builder. Cavities are made in the gravel and the nest is shaped with the tail and the larger stones are carried in the mouths of the parents. After the eggs are deposited they are covered with gravel. The eggs are not all deposited at one time.

Spawning usually begins in October, but brook trout are spawning at some locality in almost every month of the year except midsummer. The egg is about one-fifth of an inch in diameter, and varies in color from pale lemon to orange red.

THE MOON-EYE.

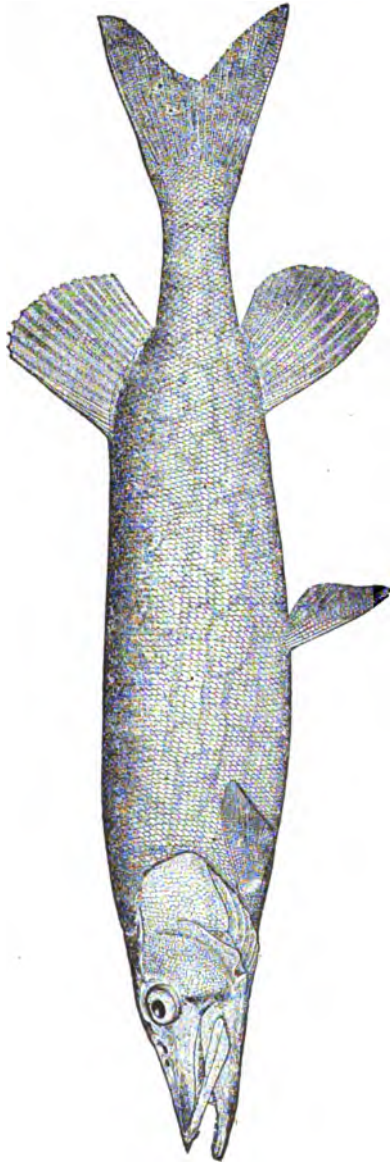
This species is called the moon-eye, toothed herring and silver bass. It is found in Canada, the Great Lake region, and the upper part of the Mississippi valley, being very common in large streams and lakes. It abounds in Lake Erie and the Ohio, and is seined in large numbers.

This species grows to a length of one foot, and, like the other, although a beautiful fish and possessed of excellent game qualities, its flesh is full of small bones. It is a good fish for the aquarium. It will take a minnow or the artificial fly very readily, and the utmost skill is required in its capture. Its food consists of insects, small fishes and crustaceans. Dr. Richardson describes this fish as a member of the minnow family, which, he says, is known to the Canadians under the name of LaQuesche. The fish is described as having the back brilliant green, sides and abdomen with a silvery lustre. The specimens which were taken in the Richelieu, where it falls into the St. Lawrence, were about nine or ten inches long.

THE BLACK-SIDED TOP MINNOW.

The black-sided top minnow, or killifish, is an inhabitant of the Mississippi valley and of streams flowing into the Great Lakes from the south. In the Mississippi valley it extends south to Texas.

This species grows to a length of three and one-half inches. It is very abundant in still waters and frequents sloughs and ponds caused by the overflow of streams. In the rivers it seeks the shelter of aquatic plants. It is a surface swimmer, and this fact gives rise to its common name. The species is useful for bait and is well adapted for the aquarium. It is a beautiful little fish and extremely hardy.



THE PICKEREL (*Esox reticulatus* Le Sueur).

THE LITTLE PICKEREL.

This pickerel inhabits the valleys of the Ohio and Mississippi rivers and streams flowing into the Great Lakes from the southward. In ponds formed in the spring by the overflow of river banks it is one of the characteristic fishes and is often destroyed in great numbers by the drying up of such bodies of water. In Iowa the little pickerel, or trout pickerel, is common in the Mississippi and its tributaries.

The fish grows to the length of one foot and is, therefore, too small to have much importance for food.

The longest known and most widely distributed species of *Esox* is the common pike—the typical species of the genus. In the subdivision into groups this would be the sole representative of the *Esox* group, which has the cheeks fully scaled and the lower half of opercles naked. The sides are pale spotted, on a darker ground and the size is very much larger than in the pickerels. Fossil remains of the pike have been found in quaternary deposits in Europe.

THE PIKE.

Pike is the best known name for this species, although the misnomer "pickerel" is rather extensively used. The origin of pike is involved in uncertainty; some trace it to the resemblance in shape of the snout to the pike or spear, while others believe it to refer to the darting motion of the fish when speeding through the water. The name pickerel is used in Vermont and around Lake George, New York. "Frank Forester" (Herbert) styles it the great northern pickerel. The name jack is applied in Great Britain to the young pike. *Brochet* is the French name, *hecht* the German and *luccio* the Italian designation of the species.

In the north temperate and arctic regions of North America, Europe and Asia the pike is equally common. In North America it extends from Pennsylvania to high northern latitudes. In Alaska Townsend and others found it above the arctic circle, and Dall and Nelson took it in abundance in the Yukon. From Greenland and the islands of the Arctic ocean the pike appears to be absent. The identity of our American pike with the common one of Europe was recognized by Cuvier and Richardson more than half a century ago; the former compared specimens from Lake Huron with European examples and Richardson with the English pike, and both were unable to find specific differences between the two.

The pike is a voracious fish and destroys everything within its reach in the form of animal life; other fish, water birds and mammals are consumed in enormous numbers. From its concealment, like a beast of prey, it darts out suddenly upon its victims and seldom misses its mark. The pike is even more destructive than the pickerel, and two of the latter, measuring five inches in length, have been reported to eat more than one hundred minnows in a day. Spawning takes place in winter and early spring on shallows and frequently upon meadows. The eggs are about one-eighth inch in diameter and a female weighing thirty-two pounds was estimated by Buckland to contain 595,000.



THE PIKE (*Esox lucius*).

The young pike has a very large yolk sac. The period of hatching varies with the temperature of the water, from fourteen to thirty days. The female is said to be larger than the male; the fish breeds at the age of three years. At the age of one year the fish may reach a length of twelve inches, and, if well supplied with food, it will increase in weight from two to three pounds yearly.

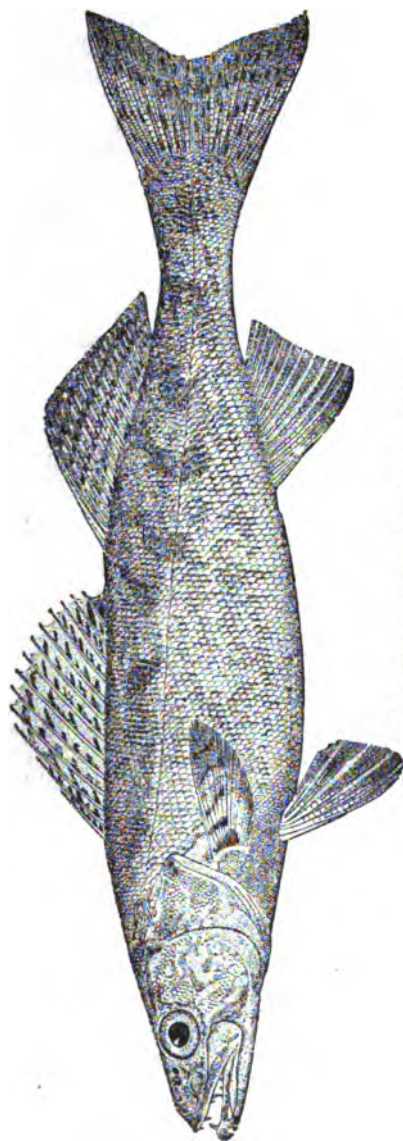
THE EEL.

The eel appears to have only one common name. It is one of the best known and most singular of our fishes, yet its breeding habits are even now enveloped in doubt. The species ascends the rivers of eastern North America, from the Gulf of St. Lawrence to Mexico, the former being the northern limit of the species on our coast. In the Ohio and Mississippi valleys it is extremely common, and its range has been much extended by the opening of canals and by artificial introduction. It has been transferred to the Pacific coast. A similar and perhaps identical species is found in northern Europe and Asia.

The eel has been known to exceed a length of four feet. Dr. Mitchell records a Long Island specimen which weighed sixteen and one-half pounds. The average length of individuals, however, is about two feet. The female is larger than the male, paler in color, and is different in certain other particulars, which will be mentioned in the description of the specimens referred to below. Both adults and young eels ascend the streams in spring, the young coming in millions, but in the fall run small eels are seldom seen. Until a comparatively recent date it was not known certainly that the eels have eggs which are developed outside of the body. Even now the breeding habits are unknown, but it is supposed that spawning takes place late in the fall, or during the winter near the mouths of rivers on muddy bottoms. Dr. Jordan has expressed the belief that the eel sometimes breeds in fresh water, since he has found young eels less than an inch long in the headwaters of the Alabama river about 500 miles from the sea. It is estimated that a large eel contains about 9,000,000 eggs. The eggs are very small, measuring about eighty to the inch, and can scarcely be seen by the naked eye. The ovary of an eel containing this number of eggs was nearly a foot in length and about one-half an inch in greatest diameter. When the eels meet obstructions in streams they will leave the water and travel through wet grass or over moist rocks.

They have not been able to surmount the falls of Niagara. At the foot of this barrier hundreds of wagon loads of young eels have been seen crawling over the rocks in their efforts to reach the upper waters.

For the sake of completing the record of the habits of the eel I quote from W. H. Ballou's description: "They are among the most voracious of carnivorous fishes. They eat most inland fishes except the gar and the chub. They are particularly fond of game fish, and show the delicate taste of a connoisseur in their selections from choice trout, bass, pickerel and shad. In their hunting excursions they overturn huge and small stones alike, working for hours if necessary, beneath which they find species of shrimp and crayfish, of which they are exceedingly fond. They are among the most powerful and rapid swimmers. They attack the spawn of other



THE WALL-EYED PIKE (*Stizostedion vitreum*).

fishes open mouthed, and are even said to suck the eggs from an impaled female. They are owl-like in their habits, committing their depredations at night."

The difference of size in the sexes has already been referred to. According to one writer the males are much smaller than the females, rarely exceeding fifteen or sixteen inches in length. The question whether eels will breed in fresh water has an important bearing upon their introduction into places from which they cannot reach the sea.

The generally accepted belief is that while the eels will grow large and fat they will not reproduce under such circumstances. The male eel has only rarely been recognized on the American coast. I had the good fortune to collect five examples on Long Island in the fall of 1884, and several specimens have been taken at Woods Holl, Mass. One of these latter specimens and several of those collected by myself were studied by Prof. John A. Ryder, of the University of Pennsylvania, and found to contain the male organs so well developed as to leave no doubt concerning the sex of the individuals. These eels, which were known to the fishermen as silver eels, have remarkably large eyes, short snout, and long pectoral fins when compared with the common form.

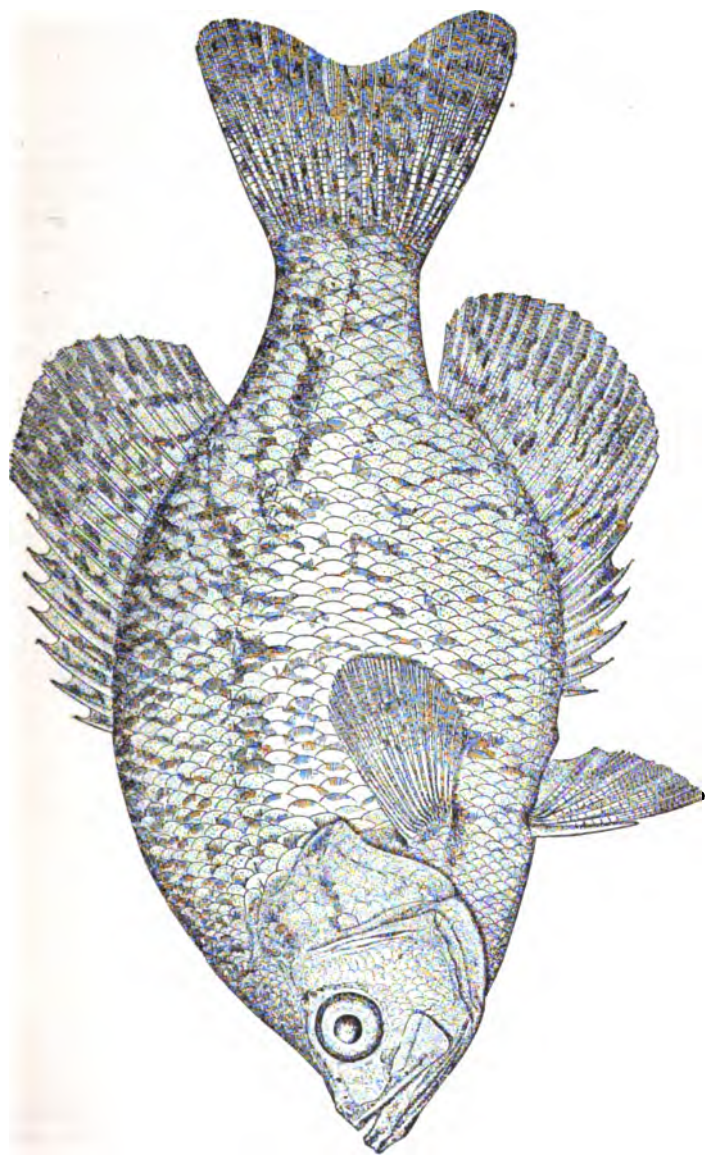
THE BROOK STICKLEBACK.

The brook stickleback grows to a length of two and one-half inches and has no value for food, but is an interesting aquarium fish. It is, however, extremely pugnacious and when kept in confinement great mortality is caused by its quarrels. The species is abundant in small streams, where it secretes itself among aquatic plants and is always on the alert for an attack upon small fishes and insects. Specimens have recently been obtained from an artesian well in South Dakota, the well having a depth of 700 feet. From this great depth the fish were brought up in full strength and vigor and were kept in an aquarium for several months afterwards. A similar occurrence has been recorded by Mrs. Eigenmann in the proceedings of the National Museum for 1883, page 217 of Williamson's Stickleback at San Bernardino, Cal. The well in this case was only 191 feet deep. There is no doubt that the fish reach the wells through streams which become subterranean in a certain part of their course.

This species is a nest builder and is vigorous in the defense of its eggs and young.

THE CALICO BASS.

The calico bass, on account of its wide distribution and variability, has received a profusion of names. Many of these are variations of the term bass. It is known, for example, as strawberry bass, grass bass, lake bass, Lake Erie bass, bank lick bass, silver bass, and big-fin bass. Other names for the species are strawberry perch, chinquapin perch, goggle-eyed perch, silver perch and sand perch. Still other names of local application are bar fish, bitter head, tin mouth, sac-a-lait, lamp-lighter, razor-back, goggle-eye, black crappie and lake crappie.



THE CALICO BASS (*Pomoxis spargyoides*).

The distribution of the calico bass is naturally extensive, and it has been still further increased by artificial introduction. The fish has been carried to France, and examples measuring about eight inches in length were recorded there several years ago. There is, however, some confusion in that country between the calico bass and the common sunfish, and there is no doubt that some of the latter species have been introduced into Germany under the mistaken belief that they were calico bass.

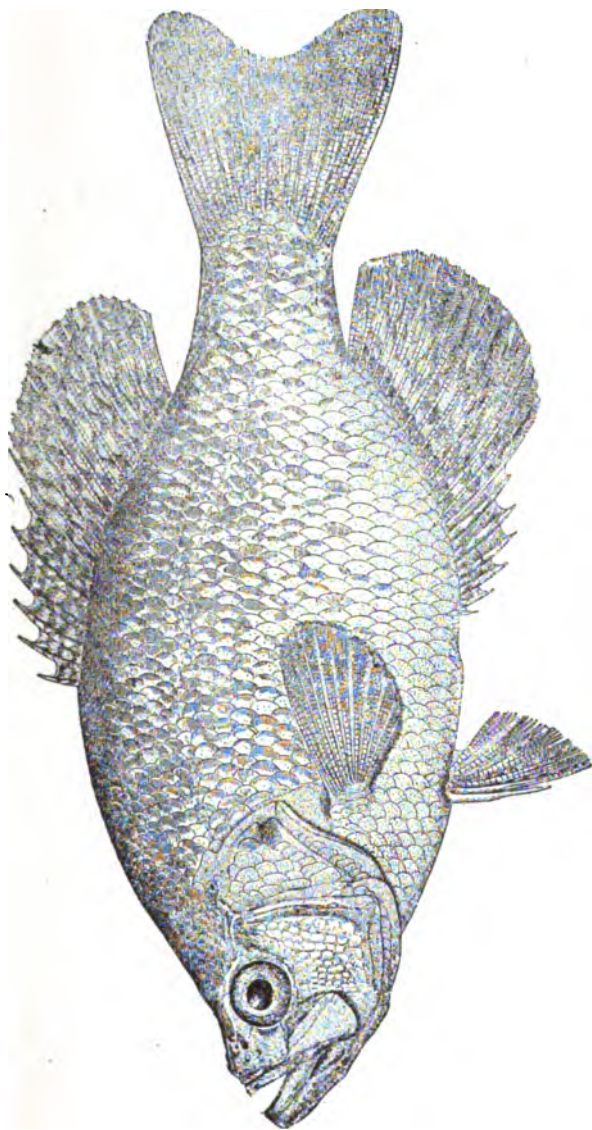
This bass is indigenous east of the Alleghenies from New Jersey southward to Georgia. It abounds in the Great Lake region, Mississippi valley south to Louisiana, most common northward, and it occurs in the Missouri. In the Ohio valley it was rather uncommon until its introduction in large numbers. This bass grows to a length of about one foot and a maximum weight of nearly three pounds, but the average weight is about one pound. It spawns in the spring and the close season in some states extends to June 1st. Gravid females were caught near Havre de Grace, Maryland, in May. These were taken in the Susquehanna and Tidewater canal, where the species is becoming rather abundant. The food of the calico bass consists of worms, small crustaceans and fishes. Although a native of deep, sluggish waters of western rivers and lakes, it readily adapts itself to cold and rapid streams, and thrives even in small brooks. The species is suitable for pond life, and may be kept in small areas of water provided they have sufficient depth. It does not prey upon other fishes, and its numerous stiff spines protect it from larger predaceous species. It swims in large schools and is often found in comparatively shoal water. The nest building habits have been described by Duclos from observations made at Versailles, France. This writer, unfortunately, had under observation both the calico bass and the common sunfish, and his statements need confirmation. The game qualities of this bass are noteworthy. It is a vigorous and free biter, and its endurance is rather remarkable considering its size. As a food fish this species is highly prized.

THE CRAPPIE.

Among the many names which have been applied to the crappie are: Bachelor, new light, Campbellite, sac-a-lait, bridge perch, strawberry perch, chinquapin perch, speckled perch, tin perch, goggle eye, John demon, shad, white crappie and timber crappie.

In the lower Mississippi valley the crappie is one of the commonest fishes. The Illinois, Ohio and Mississippi rivers are particularly noted for an abundance of crappies.

The crappie is a very general favorite for pond culture, can be readily transported and, under favorable conditions, multiplies prodigiously. Its range has been very much extended by artificial means. The best distinguishing marks between the crappie and the calico bass are the more elongated form of the crappie, the presence of six spines in the dorsal and the nearly uniform whitish color of the anal. In the crappie the greatest depth of the body is usually contained two and one-half times in the total length without the tail, while in the calico bass the depth equals one-half the length. These two species are so closely similar in size and habits that they are rarely distinguished except by ichthyologists.



THE OBAPPIE (*Pomoxis annularis*).

The crappie grows to the length of about one foot and usually weighs one pound or less, but in a lake near St. Louis an individual weighing three pounds has been recorded.

Crappie fishing usually begins in June and lasts until the coming of cold weather.

Prof. S. A. Forbes has studied the feeding habits of the crappie and finds that the young live chiefly upon *entomostraca* and small insect larvæ. The adults subsist upon the same food when obtainable, but in times of scarcity they feed to some extent upon other fishes.

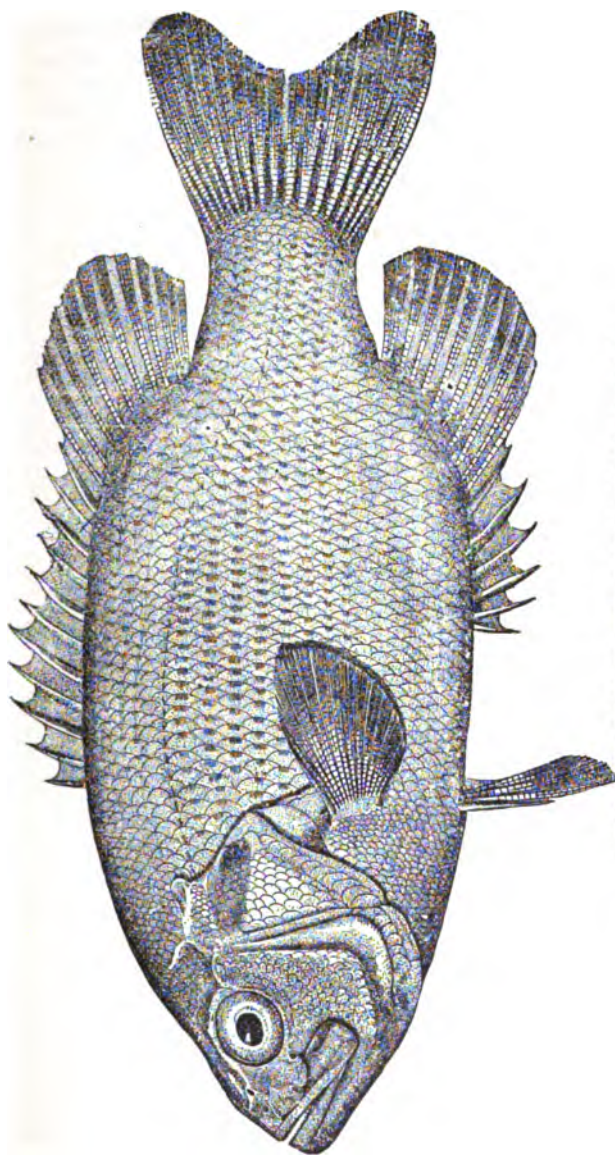
Small minnows and darters have been found in their stomachs. In the autumn Professor Forbes has found a larger percentage of small fishes, sometimes constituting nearly two-fifths of their food. The helgramite is eaten by the crappie. In cold weather it does not consume one-fourth the amount of food which it takes in the early spring. The crappie prefers still waters, thriving even in warm and muddy water, and has been taken in large numbers in mid-summer at depths of only a few feet; in cold weather it retires to deeper water, becomes rather sluggish and takes little food. The crappie is a very free biter and can be caught readily with minnows or worms. Spoon bait has been successfully used in trolling for this species. It is recorded that two men have taken a thousand crappies in three days' fishing with hook and line. As the fish is gregarious, congregating in large schools, and fearless, it can be taken in the large numbers cited. The best bait for crappie is a small shiner. It rises well also to the artificial fly. As a food fish this is one of the best in our inland waters, and its adaptability for life in artificial ponds should make it a favorite with fish culturists.

THE ROCK BASS.

The rock bass is known under a variety of names. Among them are the following: Red-eye or red eyed perch, goggle-eye and lake bass. It is found in lower Canada, Vermont and throughout the Great Lake region, west to Manitoba, and it is native in Minnesota and Dakota; southward it ranges through the Mississippi valley to Texas. In the Ohio valley it is very common, while in the middle Atlantic states, east of the Alleghanies, it has probably been introduced. Its existence in the Susquehanna has been known for about twenty years.

Under favorable circumstances as to water and food supply the rock bass grows to a length of fourteen inches and a weight of two pounds. It increases in depth and thickness with age. The largest example we have examined is one of two pounds weight, length fourteen inches, from the James river, Virginia, taken near Richmond. Dr. William Overton reports that rock bass weighing three and three-fourths pounds have been taken in his vicinity at Stony Creek, Va.

In February and March this fish frequents the mouths of small streams and in summer it seeks shady places under high banks or projecting rocks. This species is gregarious, going in large schools. It thrives where there is not much current and is very well adapted for culture in artificial ponds. It is as common in lakes and ponds as in the streams. Sluggish,



THE ROCK BASS OR RED EYE (*Ambloplites rupestris*).

pure, dark water suits it best. The fishing season begins in June and lasts until the approach of cold weather.

The rock bass feeds upon worms, crustaceans and larvæ of insects early in the season; later its food consists of minnows and crayfish. The young feed upon insects and their larvæ. The spawning season is in May and June and gravelly shoals are resorted to for depositing the eggs.

The rock bass bites very freely and is a fair game fish and excellent for the table. It fights vigorously, but its endurance is not great. Suitable baits are white grubs, crickets, grasshoppers, crayfish and small minnows. Common earthworms are also successfully used.

THE BLUE SUNFISH.

The blue sunfish, blue bream, copper-nosed bream or dollerdee, is a very widely-diffused species and varies greatly in size, color and length of the earflap. It is found in the Great Lakes and throughout the Mississippi valley to Mexico.

The blue sunfish grows to a length of nearly one foot and individuals weighing nearly two pounds are on record. Adults, however, average eight inches in length with a weight of less than one pound. The size of the individuals depend upon the habitat. In large lakes and streams it attains to a larger size than in small bodies of water. In southern waters it grows to a larger size than in northern waters. It lives in ponds as well as in streams, and thrives in warm waters. It is considered equal to the rock bass as a pan fish and can very readily be taken by hook fishing.

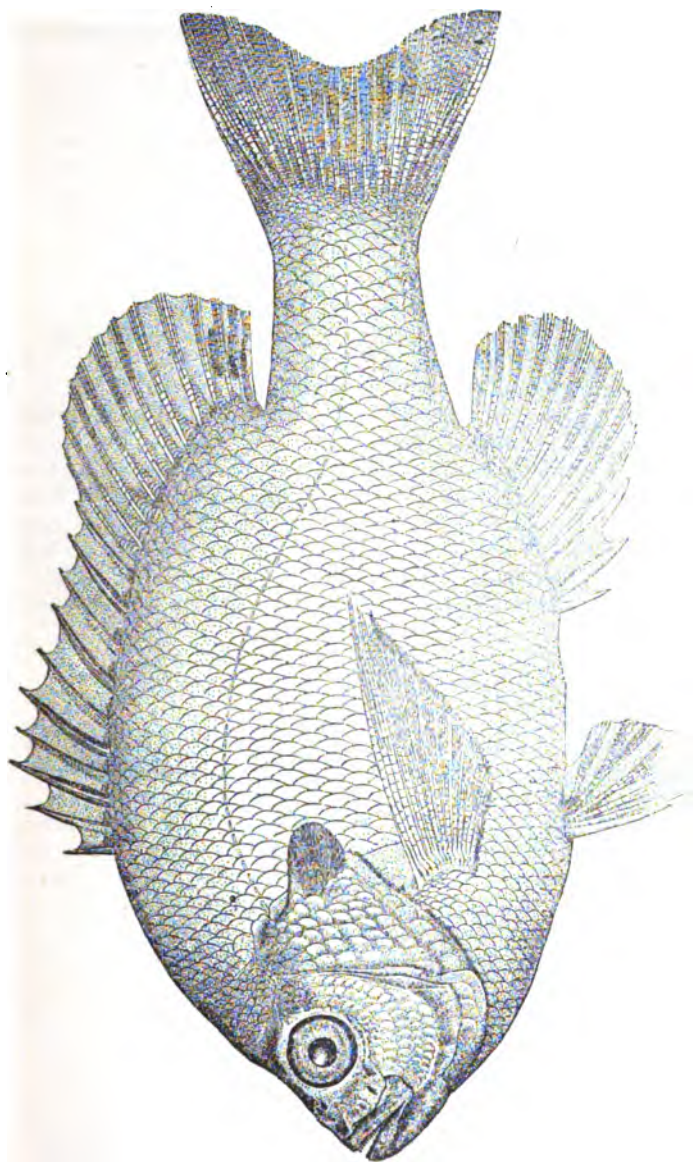
THE LONG-EARED SUNFISH.

The long-eared sunfish has a very extensive range and is known under many common names, among which are the following: Bream, red-tailed bream, red-head bream, red-bellied bream, perch, sun perch, red-bellied perch and red breast. The species is common in streams east of the Alleghenies from Maine to Florida, and in tributaries of the Gulf of Mexico to Louisiana. In the southern states the typical long-eared sunfish is replaced by a variety with larger scales on the cheeks and belly and a dusky blotch on the posterior part of the soft dorsal fin.

In size the long-eared sunfish averages about eight inches when adult and weighs about one pound. In the south the size and number of individuals is greatly increased. This fish feeds upon worms, insect larvæ, crustaceans, mollusks and small fishes.

THE RED-BELLIED BREAM.

The red-bellied bream or long-eared sunfish is very abundant in the Ohio valley and also in tributaries of Lake Erie and Lake Michigan. It extends west to Dakota, south to South Carolina and Mexico, but is absent from



THE BLUE SUNFISH (*Lepomis pallidus*).

Atlantic waters of the northern and middle states. It is especially abundant in small brooks. The species grows to a length of eight inches and is one of the handsomest of the sunfishes. The specific name is derived from the large opercular flap, generally spoken of as the ear flap.

The sides are blue and orange, the blue occurring in undulating streaks, and the orange in spots. There are distinct blue stripes on the head. The thin membranes are generally orange and the rays blue. This fish is extremely variable and has been described under about twenty different names. According to Dr. Johnson it avoids muddy water and frequents deep, still places in rivers and clear ponds. It runs into very small streams. The red-bellied bream is used for food and takes the hook very freely.

THE COMMON SUNFISH.

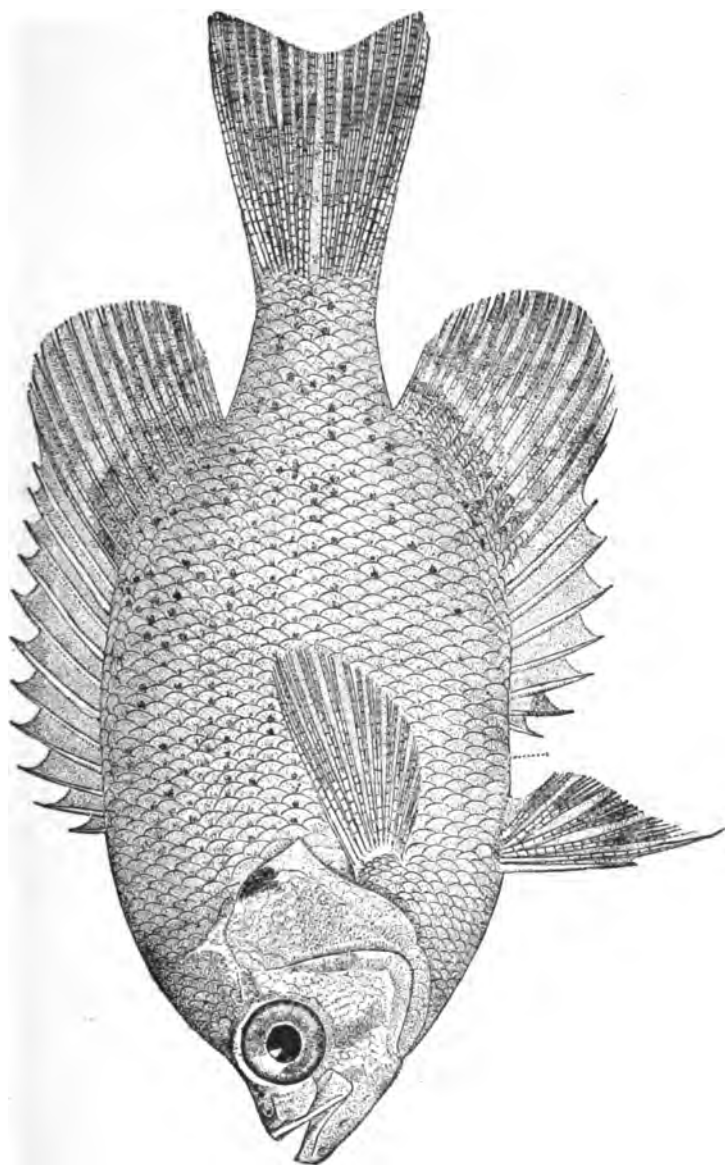
The common sunfish or sunny, pumpkin seed, bream, tobacco box and pond sunfish, is one of the best known of the native fishes of Iowa. It is found from Maine westward through the Great Lake region to Minnesota, and in the eastern states to South Carolina. In western rivers, however, it is seldom found south of the latitude of Chicago. It grows to a length of eight inches, and a weight of one-half pound. Its food is similar to that of the long-eared sunfish, and it is one of the readiest biters known to the angler. The nest is a depression in the mud, sand or gravel, hollowed out by means of the fins. The male watches the nest and drives away all intruders. The eggs are only about one-thirty-second of an inch in diameter and not very numerous. They are attached to stones and aquatic plants.

THE SMALL-MOUTHED BLACK BASS.

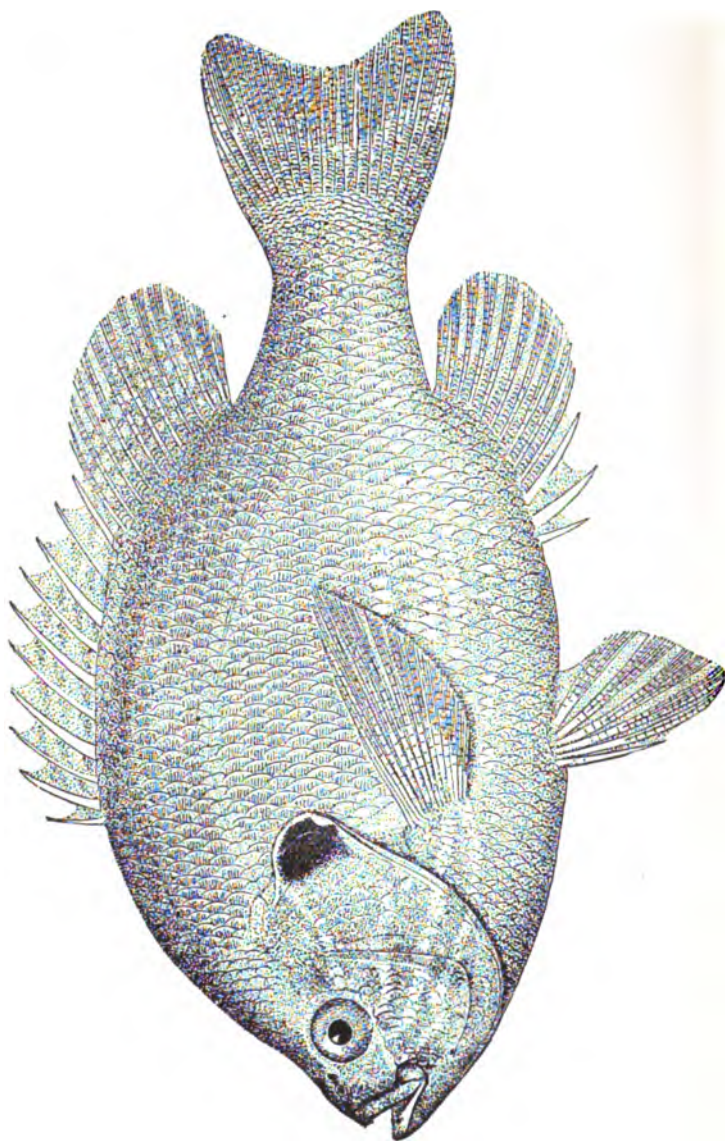
One of the early names for the small-mouthed black bass is that of growler, which appears in the writings of Cuvier, who was under the impression that the name was applied because of a noise sometimes produced by this bass. At the time of his writing the name growler was pretty generally identified with the black bass. Among the names applied to this fish by Rafinesque are lake bass, big bass, spotted bass and achigan. He also mentions it under the names painted tail, bridge perch, yellow bass, gold bass, brown bass, dark bass, minny bass, little bass, hog bass, yellow perch, black perch, trout perch, streaked head, white trout and brown trout. In the southern states the small-mouthed form is known as the trout perch and jumper. In Alabama it is called mountain trout. Some persons style it the bronze backer. The most appropriate name and the one by which it is best known is that of black bass or small-mouthed black bass.

This bass does not grow so large as the large-mouthed, seldom exceeding eight pounds in weight and averaging but two and one-half pounds. A fish of the latter weight will measure fifteen inches in length, while one of eight pounds would measure two feet.

The food of the black bass consists of crayfish, frogs, insects and their larvæ, minnows and other aquatic animals of suitable size. The young can



THE RED-BELLIED BREEM (*Lepomis nebulosus*.)



PUMPKIN-SEED OR COMMON SUNFISH (*Lepomis gibbosus*).

be fed on small fresh water crustaceans, such as *Daphnia* and *Cyclops*. Among the successful baits for this species are stone catfish, helgramites and crickets.

This bass prefers rapid water, is extremely active, and frequents clear, rapid-flowing streams where the water is pure, and thrives in greater elevations than those preferred by the large-mouthed. It hibernates in winter and spawns in the shallow or gravelly bottoms in spring. It follows its prey into shallow water, and frequently leaps far out of water in its efforts to escape from the hook or when frightened by the sudden approach of an enemy. It swims in schools and is often found in the shelter of sunken logs and in the vicinity of large rocks.

The spawning season begins in March and ends in July. The period of incubation lasts from seven to fourteen days. The eggs are bound together in bands or ribbons by an adhesive substance. They adhere to stones on which they are deposited. The parent fish build nests and protect the eggs and young. By some writers it is believed that the female prepares the nest before the male joins her. The males fight for the possession of the female, and are said to help the process of ejecting the eggs by biting or pressing the belly of the female. After the eggs are deposited the female guards the nest from the attacks of the crayfish and some other enemies. The young are consumed by many birds and by frogs and snakes, yet notwithstanding the numerous enemies of the black bass its multiplication has been rapid and enormous.

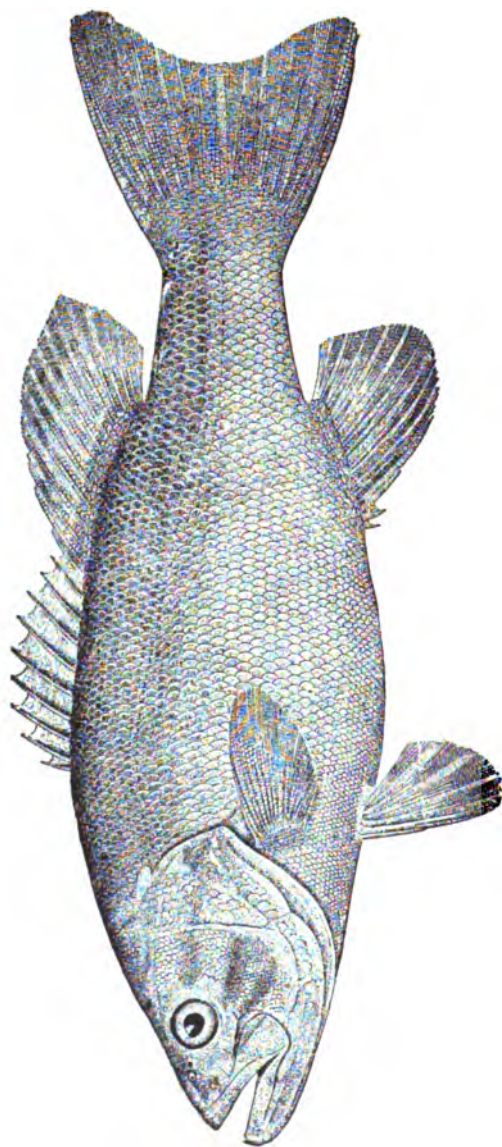
THE LARGE-MOUTHED BLACK BASS.

Common names for this species are Oswego bass, river bass, green bass, moss bass, bayou bass, trout, jumper, chub and Welshman. Throughout the North it is generally known as bass, in Virginia and North Carolina as chub, and in Florida and west to Texas as trout. The average weight of the large-mouthed bass in southern waters is less than five pounds, and still less in northern waters. In Florida it attains a large size, as much as three feet in length, and a weight of twenty-five pounds. Its growth and size depend upon the waters where found, the natural food supply of small fish crayfish, frogs, etc.

The large-mouthed bass has a wide distribution, being indigenous to the eastern United States, from Manitoba to Florida and Texas, except New England and the Middle Atlantic states east of the Alleghenies, where it has been extensively introduced. It inhabits the fresh water ponds, lakes and sluggish streams. It is also found at the mouths of rivers emptying into the Gulf of Mexico, where the water is brackish.

It is a very active fish; its movements are affected by seasonal changes, search for food and places of spawning. In polluted streams the bass are often compelled by the impurities to seek new haunts and pure water.

The young bass feed upon animal food at an early age. The large-mouthed bass is said to be more cannibalistic than the small-mouthed. Small fishes (minnows) of all kinds, crayfish, frogs, insects and their larvæ and aquatic animals of all kinds, suitable in size, make up the diet of this



THE SMALL-MOUTH BLACK BASS (*Micropterus dolomieu*).

fish. It feeds both at the surface and on the bottom, pursuing its prey with great activity. When surrounded by seines or caught on hooks this species will often leap five or six feet out of the water, and its habit of jumping over the cork lines of seines has given it the name of "jumper."

In cold weather the bass seeks deep places, often hibernating under rocks, sunken logs and in the mud. Favorite localities are under overhanging and bush-covered banks in the summer, and among aquatic plants where the fish lies in wait for its prey. The spawning season of the large-mouthed bass is about the same as that of the small-mouthed species, beginning in April and lasting until July. Its eggs are adhesive, sticking to stones during the incubation period, which lasts from one to two weeks, according to the temperature of the water. The young bass remain in the nest a week or ten days, and at the age of two weeks will measure about three-fourths of an inch in length. In suitable waters it is estimated that the large-mouthed bass will weigh, at the age of three years, from two to four pounds.

THE JOHNNY DARTER.

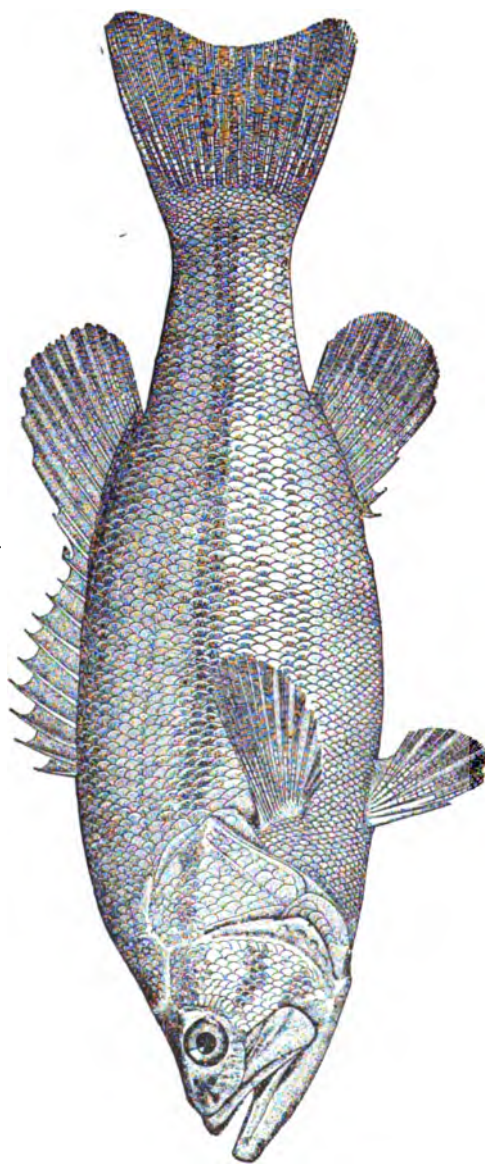
The Johnny darter ranges from western Pennsylvanian to Missouri and Dakota. In the Great Lake region it is abundant, and is one of the commonest darters in the streams of Iowa.

THE BLACK-SIDED DARTER.

The black-sided darter or blenny darter is found from western Pennsylvania to Dakota and Arkansas. It grows to a length of four inches, and is among the most beautiful of the darters. It prefers clear streams with gravelly bottoms, and is more active in its habits than most of the other species, not concealing itself so closely under stones. It is admirably adapted for life in the aquarium.

THE BLUE DARTER.

The blue darter, Johnny darter, rainbow darter and soldier fish, is found in the Ohio valley and in some parts of the Mississippi valley. It reaches the length of two to three inches, and is one of the most brilliantly colored of all the darters. It frequents gravelly bottoms in deeper parts of streams, and is not common in small brooks. The blue darter is not so active as some of the other members of its family, but in coloration it is the most beautiful of all darters.



LARGE-MOUTHED BLACK BASS (*Micropterus salmoides*).

THE YELLOW PERCH.

The yellow perch, ringed perch or striped perch is found throughout the Great Lake region, rivers and ponds of New England and northwestward, and in streams east of the Alleghenies south to Georgia. It does not occur in the Ohio valley or southwest.

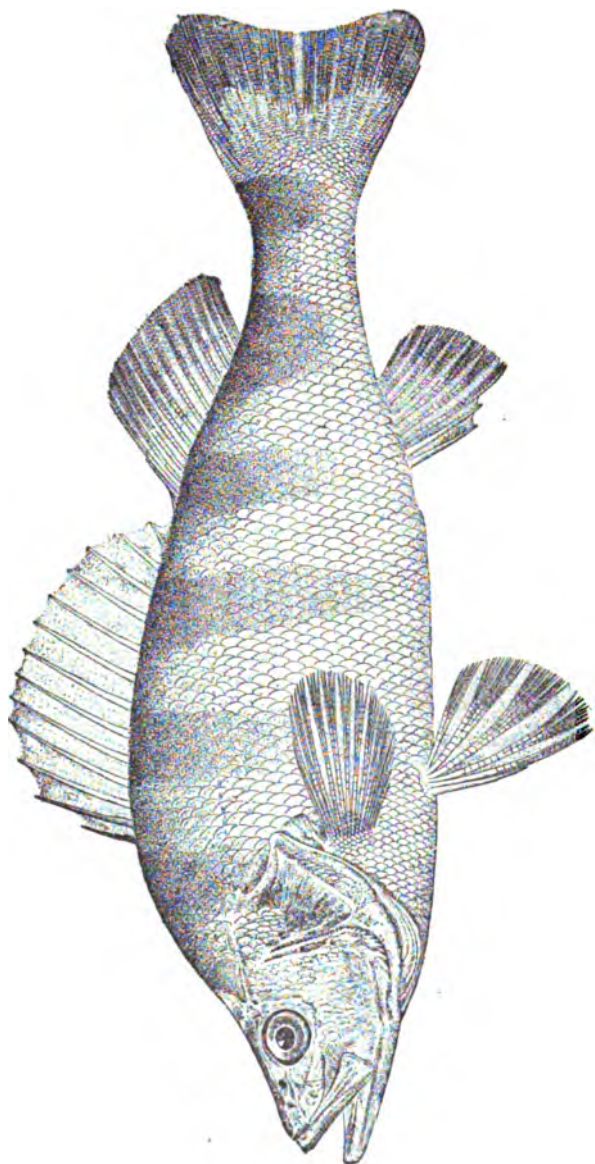
The species reaches a length of one foot and weight of two pounds. It is one of the best known of our food fishes and has excellent game qualities. Its flesh, however, is rather soft and coarse and is far inferior to that of the black bass and other members of the sunfish family. It is a voracious feeder, its food consisting of small fishes, crustaceans, and other animal matter.

The yellow perch spawns early in the spring. The eggs are adhesive and enclosed in thin translucent strips of adhesive mucus.

THE PIKE-PERCH.

The pike-perch has received a great many common names. One of the most suitable is that of "Susquehanna salmon," which is used in Pennsylvania. In the eastern states the species is styled the perch-pike or the pike-perch, glass-eye and wall-eyed pike. In the Great Lake region it is known as blue pike, yellow pike, green pike and grass pike. In the Ohio valley and western North Carolina it is the jack; in Lake Erie and Canada, the pickarel; in some parts of the Ohio valley it is the white salmon or jack salmon. The Cree Indians call it the okow and the French Canadians dore or picarel. Among the fur traders of British America it is called the horn-fish.

The pike-perch, or wall-eyed pike, inhabits the Great Lake region, and extends northward into British America, where it has been recorded as far as fifty-eight degrees north by Dr. Richardson. It ranges south in the Mississippi valley to Arkansas, and in the Atlantic streams to Georgia. This species is said to reach a weight of fifty pounds, but the average weight of the market specimen is less than five pounds. In the Susquehanna it occasionally reaches ten pounds or upwards in weight. The pike-perch feeds on the bottom upon other fishes, and has been charged even with destroying its own young. It prefers clear and rapid waters, and lurks under submerged logs and rocks, from which it can readily dart upon its prey. Spawning takes place in April and May, and in Pennsylvania continues until June. Favorite spawning places are on sandy bars in shallow water. The period of hatching varies from about fourteen to thirty days, depending upon the temperature of the water. The eggs vary from about seventeen to twenty-five to the inch, and a single female has been estimated to contain from 200,000 to 300,000. In a state of nature only a small percentage of the eggs are hatched out; the greater portion are driven upon the lake shores by storms and devoured by fishes upon the spawning beds. The number of pike-perch annually hatched by artificial methods is enormous. This advance is due to improvements in the treatment of adhesive eggs. Formerly these were hatched by placing them on glass plates, to which they readily adhere. Recently it has been found that the sticky substance can be washed off the eggs, after which they are placed in jars and hatched like eggs of the shad and whitefish. Iowa has distributed a large number of pike-perch throughout the state.



YELLOW PERCH (*Perca flavescens*).

THE SAUGER.

The sauger is known also as sand pike, gray pike and green pike, pickerel, pickerel and horse fish. It is found in the St. Lawrence river and the Great Lake region, the upper Mississippi and Missouri rivers and in the Ohio, where it is said to have been introduced from the lakes through canals.

This is a small fish, seldom exceeding eighteen inches in length, and embraces several varieties, only one of which is found in Pennsylvania, the one called gray pike. It is a very common fish in the Great Lakes and is abundant in the Ohio river. It is doubtful whether it is native to Ohio or introduced. It is very extensively used for food but is not equal to the pike perch.

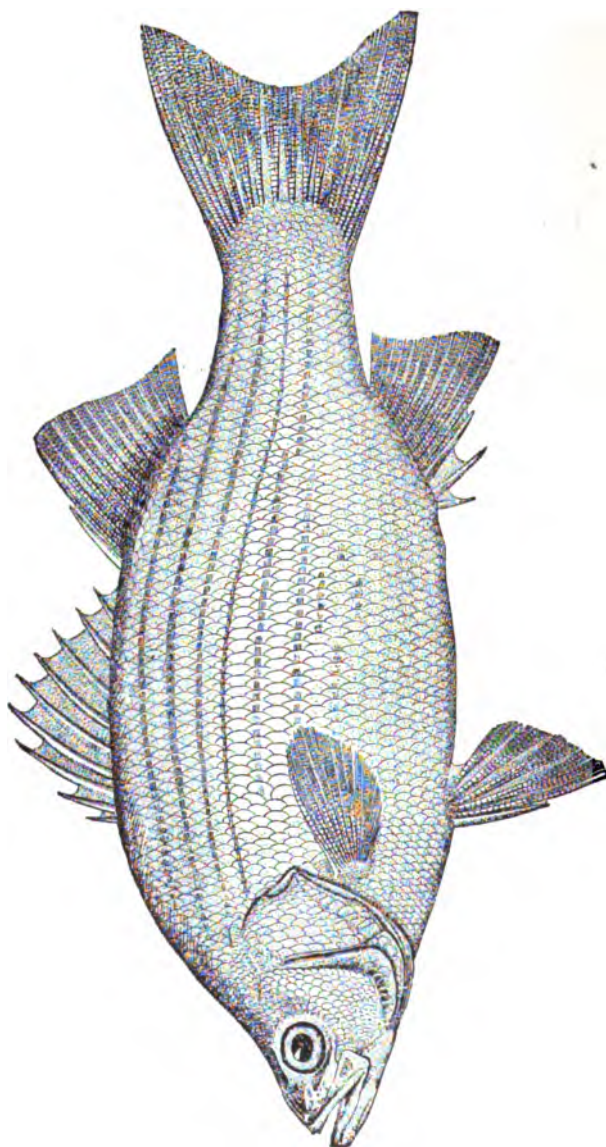
THE WHITE OR SILVER BASS.

The white bass is sometimes called striped bass, and is probably the silver bass of Canada. Its center of abundance is the great lake region, but it is also widely distributed over the Ohio and Mississippi valleys. In Iowa the species is found in the Mississippi and its tributaries. The white bass weighs from one to three pounds, and its flesh is considered almost, if not equally, as good as that of the black bass. It prefers the deeper parts of rivers and thrives best in lakes and ponds. In April and May they leave the deeper waters and go in near shore or to the mouths of rivers, where they spawn. The spawning period is in May and June.

The white bass feeds upon minnows, crayfish, and other fresh water crustaceans, also minute mollusks or shell fish, and is said to devour many young whitefish upon the spawning grounds of that species. It is a game fish and affords good sport to the angler.

THE YELLOW BASS.

The yellow bass appears to have no other common name. It inhabits the lower Mississippi valley, extending northward to southern Indiana and Illinois. The species grows to the length of one foot. Nothing is recorded about its habits, which are supposed to resemble those of the white perch.



WHITE OR SILVERBASS (*Roccus chrysops*).

IOWA'S MEANDERED LAKES.

A statement of the meandered lakes of Iowa, their locality, area, and shore line, as shown by the meander notes of the government survey of same.

LAKE.	Township.	Range.	LOCALITY OF LAKE. COUNTY.	Estimated area in acres.	ESTIMATED SHORE LINE.		
					Miles.	Chains.	Links.
*Goose lake, in sections 28, 29, 33 and 33.....	N 83	E 3	Clinton.....	301.55	2	65	49
Muscotine slough in sections 7, 17, 18, 20, 21, 23 and 29..	N 74	W 5	Louis a.....	570.00	19	31	40
Clum lake.....	N 75	W 5	Louis a.....	193.00	3	15	11 1/4
Green bayou, in sections 26, 27, 28, 29, 31, 33 and 33.....	66	3 and 3	Lee.....	571.00	8	48	37
Keokuk lake, in sections 13, 22, 23, 24, 29 and 27.....	76	3	Muscotine.....	454.00	5	26	23
Lake in sections 1 and 2.....	96	3	Allamakee.....	161.86	2	50	68
Lakes in sections 16, 20 and 21.....	88	4	Delaware.....	44.35	1	53	27
Two lakes in sections 13, 24 and 25.....	100	4	Allamakee.....	200.00	3	33	...
Swan lake.....	80 and 81	7	Johnson.....	45.00	1	10	55
Lake in sections 4, 5, 8, 9, 16 and 17.....	99	3	Allamakee.....	679.00	6	16	30
Lake in sections 30 and 31.....	81	7	Johnson.....	62.72	2	6	...
*Lake Rice.....	96	23	Cerro Gordo.....	3,642.87	13	35	43
Silver lake, in sections 14 and 15.....	99	23 and 23	Worth and Winnebago.....	600.00	7	86	76
Bright's lake, in sections 7, 8 and 17.....	100	22	Worth.....	818.00	3	8	95
Iowa lake, in sections 14, 15, 22, 23, 24, 25 and 26.....	88	23	Worth.....	155.00	2	13	50
Wall lake, in sections 9, 10, 15 and 16.....	86	24	Hamilton.....	895.54	6	34	13
Lake in section 27.....	87	24	Hamilton.....	304.55	2	67	...
Galro lake.....	87	24 and 25	Hamilton.....	143.00	2	1	55
Walled lake, in sections 3, 10, 11, 14 and 15.....	90	24	Hamilton.....	1,382.00	5	63	43
Cornelia lake, in sections 9 and 16.....	92	24	Wright.....	995.85	6	73	91
Elfin lake, in sections 21, 22, 27 and 28.....	92	24	Wright.....	333.43	7	71	97
Twin lake in sections 23 and 29.....	93	24	Wright.....	450.33	1	67	33
Lakes in sections 19, 20, 23 and 30.....	94	24	Hancock.....	107.07	3	4	...
Lake.....	96	24 and 25	Hancock.....	193.00	1
Lake.....	96	24 and 25	Hancock.....	106.00	5	23	84
Duck lake, in sections 20 and 21.....	100	24	Winnebago.....	915.00	1	27	40
Lake, in se q of section 24.....	96	25	Hancock.....	71.30	1	1	47
Lake, in sections 9, 10, 15 and 16.....	97	25	Hancock.....	69.00	3	63	13
*Impassable marsh.....	91 and 92	27	Humboldt.....	253.68	2	33	15
Owl lake, in sections 21, 22, 27 and 28.....	91 and 92	27	Humboldt.....	1,742.30	9	23	...
			Humboldt.....	772.14	4	65	...

MEANDERED LAKE 3—CONTINUED.

LAKE.	LOCALITY OF LAKE.			Estimated area. In acres.	ESTIMATED SHORE LINE.		
	Township.	Range.	COUNTY.		Miles.	Chains.	Links.
Lake.	90 and 91	29	Webster and Humboldt.	211.00	2	40	87
Bass lake.	91	29 and 30	Humboldt.	238.00	2	60	79
Bancroft lake, in sections 10, 14 and 15.	100	30	Kossuth.	752.00	2	60	79
Lake, in section 17.	94	30 and 31	Greene.	712.00	2	60	79
Lake, in section 28.	100	30	Kossuth.	170.45	2	38	78
Lake, in sections 9 and 10.	100	30	Kossuth.	147.40	2	40	
Lizard lake, in sections 25 and 27.	91	30	Kossuth.	48.00	2	40	
Walled lake, in sections 11, 12 and 14.	100	31	Pocahontas.	283.33	2	73	
Lake (medium).	100	31	Emmet.	283.33	2	73	
Swan lake (seven or eight miles long).	88 and 89	32 and 33	Calhoun.	575.00	2	42	15
Lake Okmappaduh, in sections 10, 11 and 12.	90 and 91	32 and 33	Palo Alto.	571.00	2	42	15
Lake, in section 10.	100	32 and 33	Emmet.	230.00	2	30	70
Lake, in sections 11, 12 and 13.	90 and 91	32 and 33	Emmet.	945.00	2	30	70
Lake, in sections 14, 15 and 22.	100	33	Emmet.	147.00	2	18	38
Lake, in sections 16 and 17.	100	33	Emmet.	180.84	2	18	38
Lake, in sections 18, 19 and 20.	90 and 91	33	Calhoun.	480.00	2	41	59
Lake, in sections 21, 22 and 23.	90 and 91	33	Emmet.	481.00	2	43	
Lake, in sections 24, 25 and 26.	90 and 91	33	Emmet.	337.00	2	70	29
Lake, in sections 27, 28, 33 and 34.	90 and 91	33	Emmet.	419.25	2	40	
Lake, in sections 16 and 17.	100	33	Emmet.	177.90	2	63	
Tow Head lake, in sections 23 and 24.	91 and 92	33	Emmet.	195.05	2	15	6
Tow Head lake, in sections 23 and 24.	91 and 92	34	Calhoun.	170.00	2	8	63
Tow Head lake, in sections 9, 15, 16 and 17.	91 and 92	34	Pocahontas.	618.00	2	15	23
Rush lake, in sections 20 and 21.	94	34	Palo Alto.	501.15	2	20	20
Silver lake, in sections 18, 19, 21, 28 and 29.	94	34	Palo Alto.	658.10	2	71	23
Lake, in sections 29 and 30.	94	34	Palo Alto.	193.57	2	29	35
Lake, in sections 16, 17, 19, 30 and 31.	94	34	Palo Alto.	458.45	7		
Lake, in sections 11, 14 and 23.	100	34	Emmet.	3,425.00	28	3	15
Lost Island and Pelican lakes.	94 and 97	35	Palo Alto and Olney.	1,773.00	28	3	15
Trumbull lake.	96 and 97	35	Olney.	300.93	3	27	23
Twelve Mile lake, in sections 20, 21 and 29.	96	34	Emmet.	316.43	3	74	16
Overlook lake, in sections 20, 21 and 29.	96	34	Emmet.	219.00	3	69	33
Lake, in sections 4, 5, 8 and 9.	99	34 and 35	Emmet and Dickinson.	246.19	1	48	31
Rush lake, in sections 8 and 17.	99	35	Emmet.	63.60	1	26	5
Lake, in sections 25 and 26.	99	35	Emmet.	173.97	1	13	60
Lake, in sections 25 and 26.	99 and 94	35	Buena Vista and Olney.	235.23	2	22	22

	95 and 96	35	Clay	305.00	1	40	95
Lake	95	35	Clay	305.00	1	40	95
Lake, in sections 8, 9, 15, 17 and 20.	96	35	Clay	219.00	4	33	97
Lake, in sections 7 and 18	96	35	Dickinson	127.00	1	63	75
Lake	96	35 and 36	Dickinson	110.00	2	4	75
Walt lake	96 and 97	35	Dickinson	975.15	9	38	75
Spirit lake	99 and 100	36	Dickinson	5,676.00	4	30	86
Okoboji, east	99 and 100	36	Dickinson	1,849.00	23	73	86
Okoboji, west	99 and 100	36	Dickinson	3,683.00	38	88	7
Gar lakes, in sections 29, 30 and 32	99 and 100	36 and 37	Dickinson	194.00	3	33	84
Two lakes, in sections 5, 6, 7 and 8.	99	36	Dickinson	233.42	3	7	86
Lake, in section 23	99	36	Dickinson	138.37	1	1	90
Lake, (Star), just west of Spirit lake	100	36	Dickinson	990.00	12	25	92
Ston lake	99	37	Brenn Vista	3,224.47	9	61	67
Lake, in sections 31 and 32	99	37	Dickinson	143.00	3	13	84
Lake, in sections 30 and 31	99	37	Dickinson	157.40	2	62	24
Diamond lake, in sections 10, 11, 14 and 15	100	37	Dickinson	164.53	4	10	20
Lake, in sections 23, 24, 25 and 26	100	37	Dickinson	50.90	24	30	11
Lake	100	37	Dickinson	70.90	1	14	31
Silver lake, in sections 27, 28, 29, 32, 33 and 34	100	38	Dickinson	1,047.40	6	41	70
Lake on Minnesota state line	100	39	Oacola	155.90	2	1	70
Rush lake	100	39 and 40	Oacola	357.53	3	33	61
Wabonsie lake, in sections 2 and 3	70	43	Premont	280.00	1	67	36
Lake, in sections 29 and 39	74	43	Pottawattamie	72.48	1	53	50
Lake, in sections 11, 14, 15, 23 and 33	75	44	Pottawattamie	430.79	6	39	40
Lake, in sections 2, 3, 10 and 11	76	44	Pottawattamie	224.63	4	19	77
Boyer lake, in sections 21, 22, 27 and 28	78	44	Pottawattamie	583.00	5	10	35
Lake	77 and 78	45	Pottawattamie and Harrison	78.78	2	4	35
Lake, in sections 22, 23 and 24 (Soldier)	78	45	Harrison	266.91	4	48	90
Lake, in sections 2, 11, 14, 15, 23 and 27	80	45	Harrison	533.00	3	35	20
Lake, in sections 13, 14, 23 and 24	80	45	Harrison	416.88	3	25	63
Blue lake	83 and 84	45 and 46	Monona	1,598.60	10	28	63
Lake, in sections 10, 11, 12, 13, 14, 23, 24, 26, 27 and 34	86	47	Woodbury	991.27	13	8	59

*Goose lake, in Clinton county, was drained, surveyed, and approved as swamp land and patented to the county as swamp land, October 7, 1896.

†The "Impassable marsh," in Humboldt, has been surveyed, approved, and patented to the state as swamp land, and patented by the state to Humboldt county.

Dup. in acc. no. 76325
call no. 353,9777.1. 9.5



Fourteenth Biennial Report

OF THE

UNIV. OF MICH.

JUN 16 1908

State Fish and Game Warden

TO THE

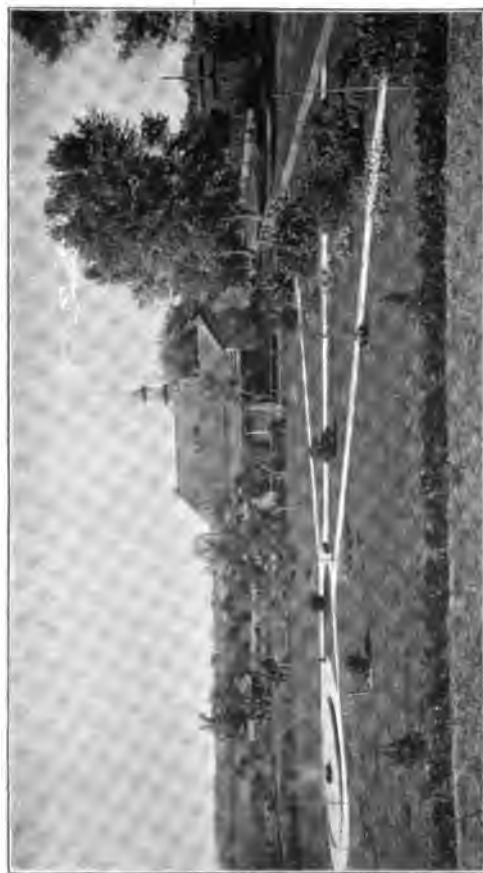
Governor of the State of Iowa

1900-1901

GEO. A. LINCOLN, WARDEN.

PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

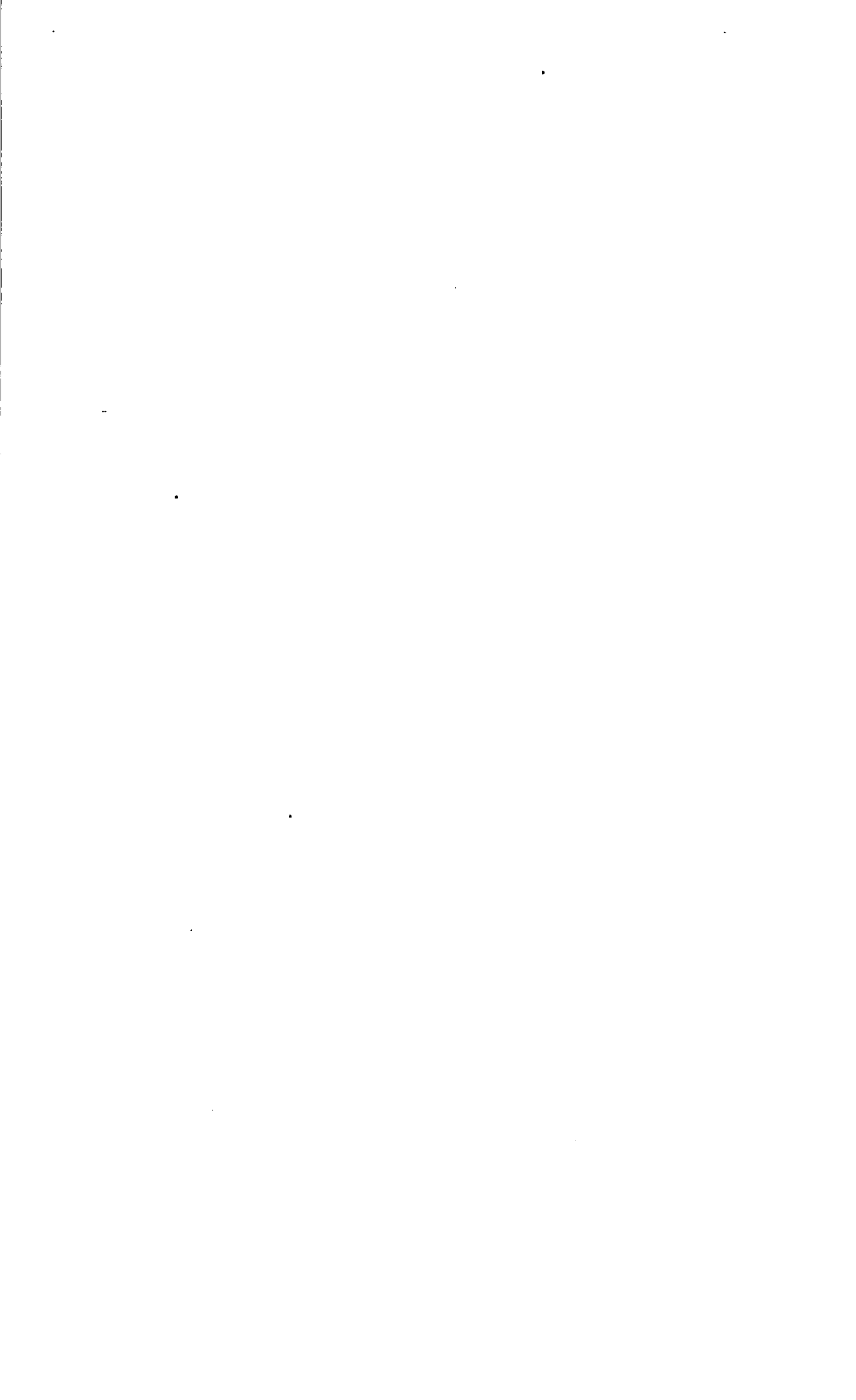
DES MOINES:
B. MURPHY, STATE PRINTER.
1908.



ARTISIAN WELL AL LA BULA THAT FURNISHES STATE RETAINING POND WITH WATER.



HATCHING PONDS. STATE HATCHERY.



REPORT.

To His Excellency, Leslie M. Shaw, Governor of the State of Iowa:

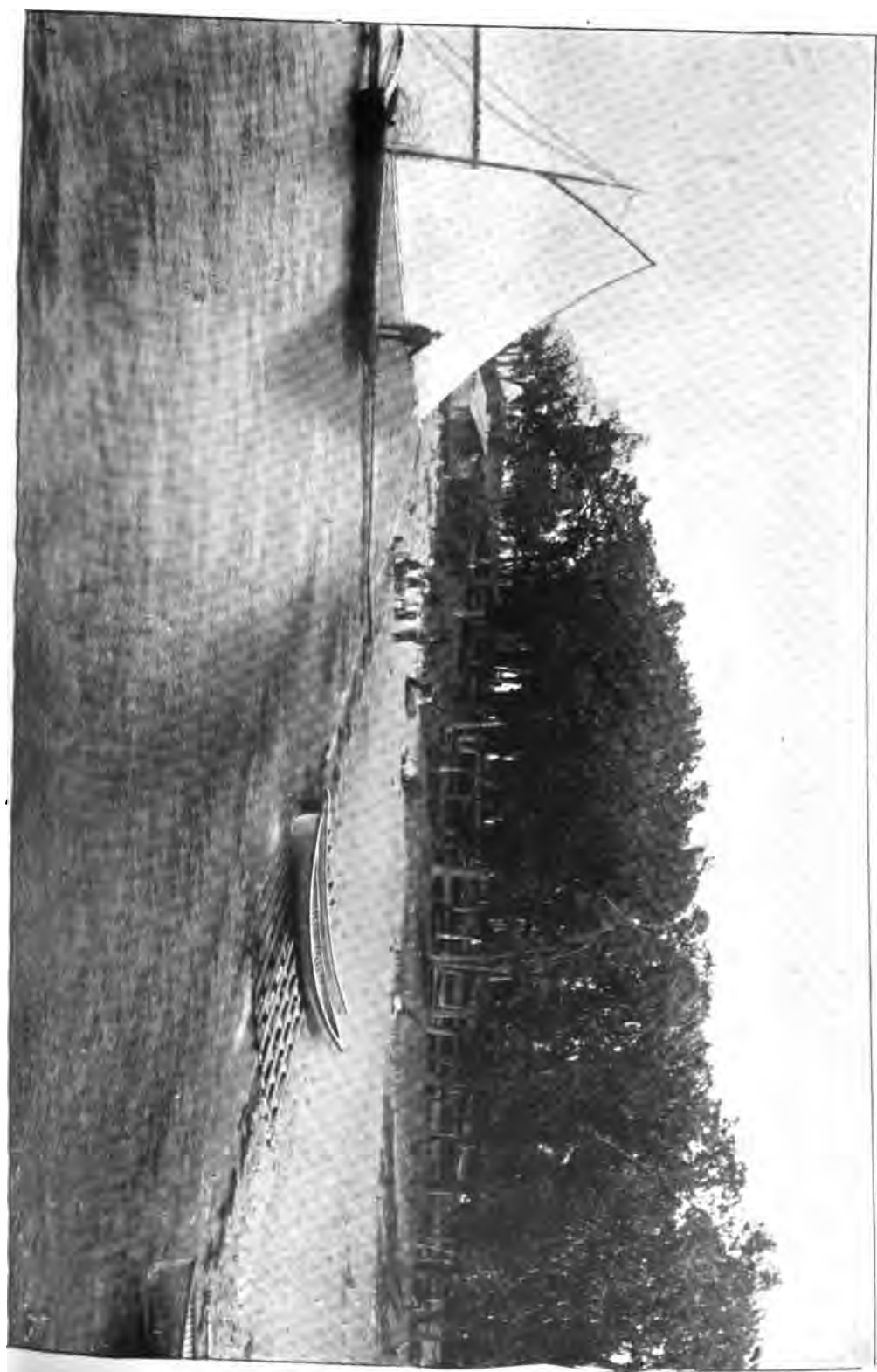
DEAR SIR—Pursuant to the provisions of section 2539, creating the office of fish and game warden, I submit herewith for your consideration the fourteenth biennial report of the state fish commissioner and the second biennial report of the state game warden.

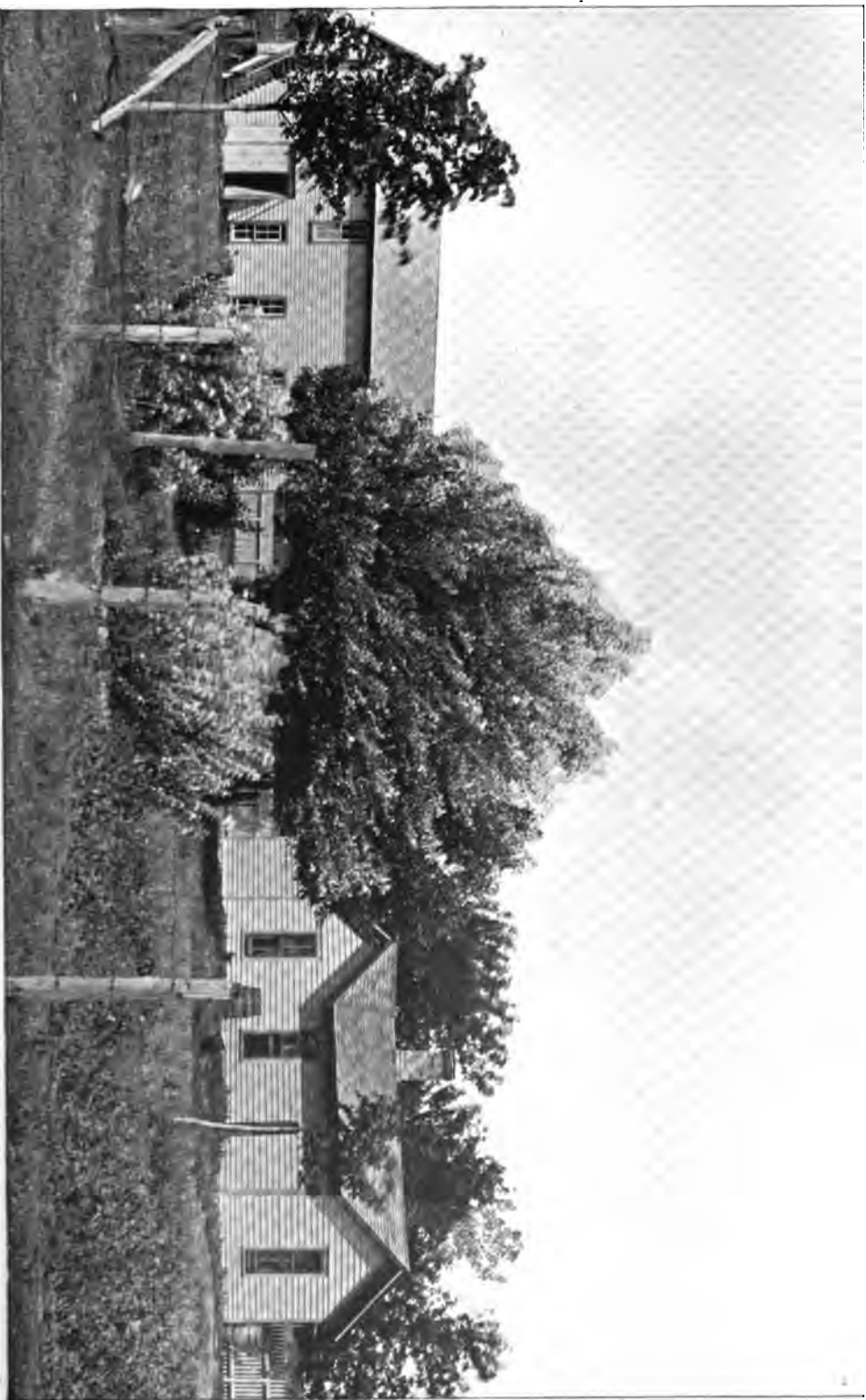
The data contained within this report for the period prior to April 1, 1901, have been obtained from the various records and books to which I have had access, while the information covering the period from April 1, to November 1, 1901, is from my personal knowledge and actual experience, my appointment to the office having been made at the first mentioned date. I should be pleased to make a further and more detailed report of the placing of fish in private waters throughout the state had I the data at hand. In relation to the public waters, their disposition is fully shown herein.

The articles contained in the following inventory came into my hands as state property from former warden, George E. Delavan. Except for the seines and some other minor articles, the same were in good condition throughout:

- 1 50-foot seine, 1 inch mesh.
- 1 50-foot seine, 1 inch mesh.
- 9 glass hatching jars.
- 12 glass tubes for hatching jars.
- 1 aquarium, 2x6 feet.
- 4 zinc hatching boxes.
- 1 fish food chopper.
- 1 walnut table, 5 feet.
- 1 Code of Iowa, 1873.
- 1 old ledger, 1878.
- 1 commissioner's account book. (In car.)
- 1 commissioner's record.
- 1 blank book, canvas cover.
- 15 United States fish commissioners' reports.
- 6 40-gallon fish cans.
- 2 10-gallon fish cans.

2 12-foot troughs, for hatching boxes.
2 6-foot troughs.
1 250-barrel fish tank.
1 row-boat, with two pairs oars and anchor.
1 old boat and one pair oars.
1 grindstone and frame.
35 hatching boxes with trays.
13 carp pails.
1 handsaw.
1 handax.
1 pair pipetongs.
1 pick.
1 stove and pipe. (In hatchery.)
1 garden rake.
2 small monkey-wrenches.
2 Halliday windmills, and pumps. (One fan short.)
1 fish car.
20 fish tanks.
1 gasoline stove.
1 hard coal stove. (In car.)
1 cane seat revolving chair.
Wood seat office chairs.
1 cuspidor.
5 bracket car lamps. (Brass.)
1 coal hod.
10 sheets.
4 comforts.
8 $\frac{1}{2}$ pair blankets.
4 pillows.
7 $\frac{1}{2}$ pillow-cases.
3 towels.
1 feather duster.
1 small broom.
1 screw-driver.
1 lot dishes and kitchen utensils.
2 bunk canvas.
12 journal brasses.
50 feet $\frac{3}{4}$ -inch hose.
1 400-foot seine.
1 200-foot seine.
1 150-foot seine.
1 75-foot seine,
1 1,200-foot seine, and ropes complete.
3 fish-pail yokes.
1 box report cuts. (In hands of F. R. Conaway.)
1 lawn mower at hatchery.
1 hatchet in car.
1 box report cuts in car.
1 gasoline launch, complete, Fairbanks and Morse engine. (Sabula.)
5 fish boxes. (Sabula.)





STATE HATCHERY AND ASSISTANT SUPERINTENDENT'S RESIDENCE.

1 boat-house 32 by 12 feet and anchor ropes complete. (Sabula.)
1 lawn mower. (Sabula.)
1 rake. (Sabula.)
150 feet 1-inch rubber hose. (Sabula.)
6 empty fish barrels. (Sabula.)
1 dip net. (Sabula.)

The only cost for equipment since my appointment has been for the placing of concrete bottoms in the state ponds at Sabula, for the repair of the windmills at the hatchery, and for the purchase of one new fishing boat.

STATE HATCHERY AT SPIRIT LAKE.

When the state hatchery was first located at Spirit Lake, there was a free flow of water between the two lakes "Spirit" and "East Okoboji," which seemed to insure a sufficient supply for the propagation of fish. However the water in each of these lakes has so far receded that there is now no connection between them, and the water furnished is inadequate for proper culture. This has rendered it necessary to pump all water used in the ponds by windmills, a slow and unsatisfactory process. What will be the outcome and disposition of this plant will have to be determined after the season is over and the final result of the year is shown. In preceding seasons Mr. S. B. Peterson, the superintendent, has raised a great many goldfish and carp, and a few varieties of game fish, which have been distributed at various places throughout the state as shown by former reports. This year, either on account of the extreme cold weather, the failure of the water-supply, or from other causes unknown, there have been so few even raised that there has been practically none for distribution. I am informed that all the hatcheries in Iowa have to a great extent proved disappointments and failures this season.

GATHERING FISH AT SABULA.

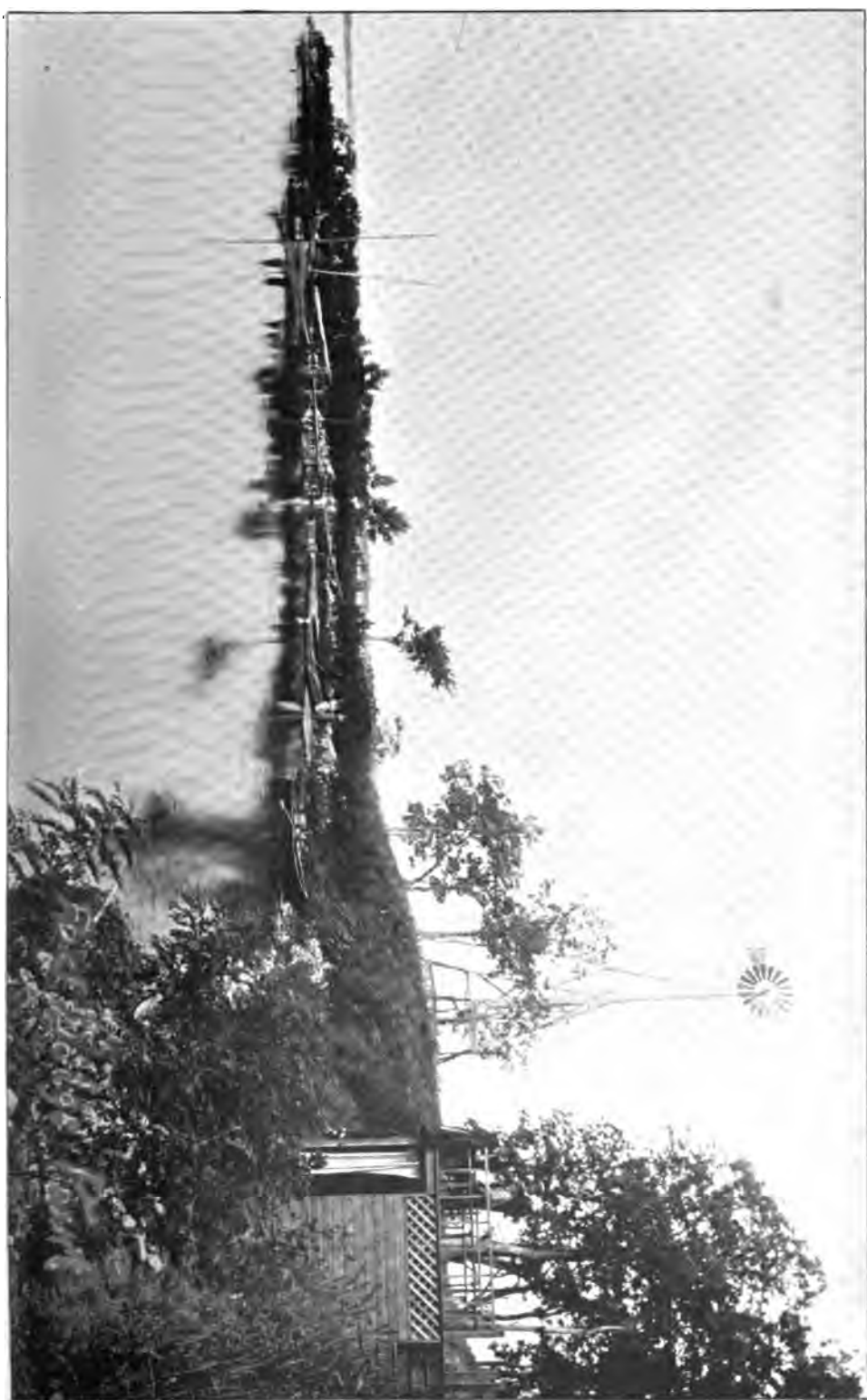
As pointed out in the last report of my predecessor in office, the facilities at Sabula for gathering small fish for distribution are unusually good, the equipment being first-class and the supply inexhaustible. The ponds, under the care of Mr. Charles H. Swift, are in fine condition. The presence of the state launch at Sabula will also prove of great assistance in securing quantities of fish from the rivers and bayous of the Mississippi, and I anticipate being able this fall to place within the interior waters of the state great quantities of food and game fish, consisting of black and silver bass, pike, crappie, perch, sunfish, and channel

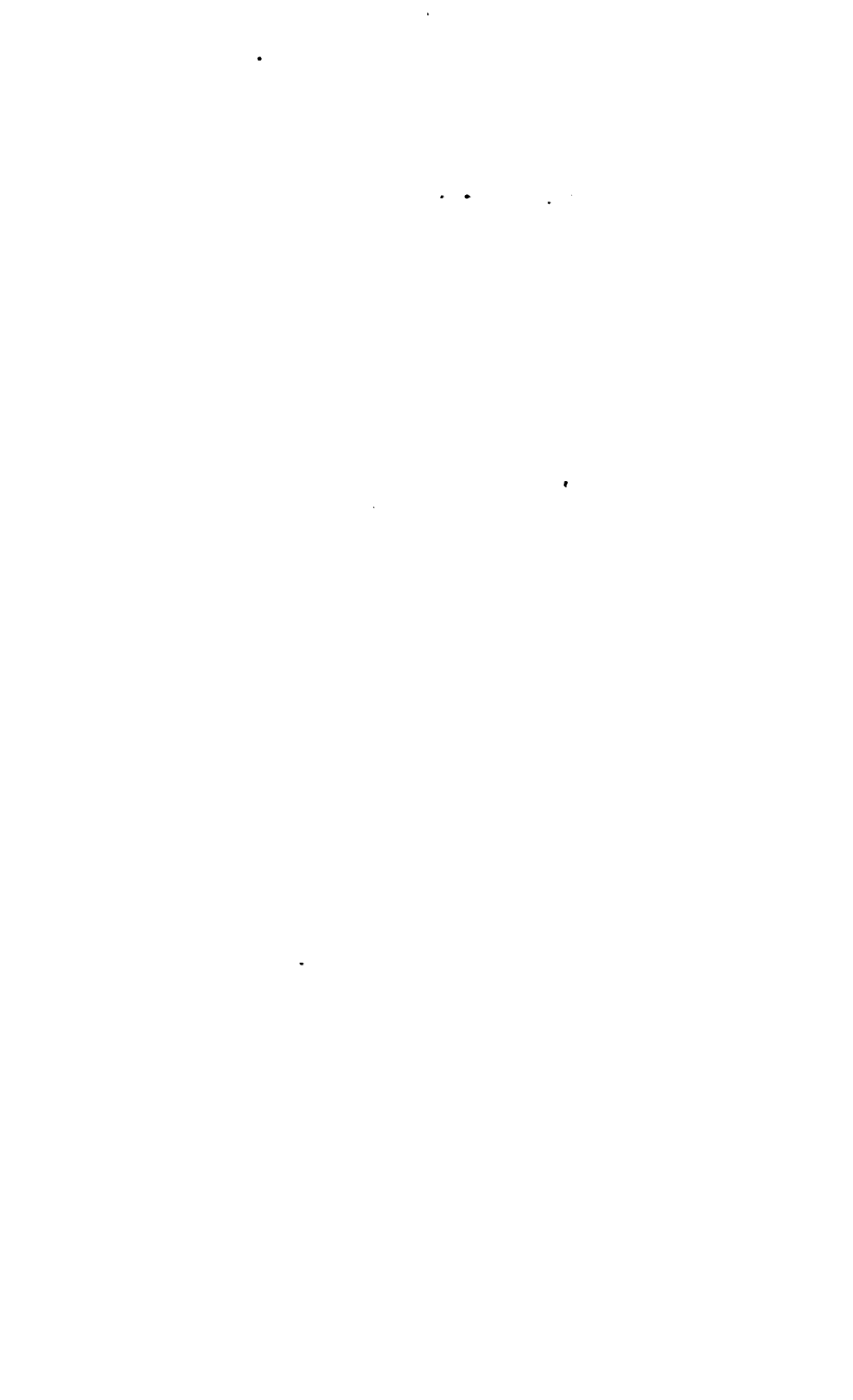
cat. This is to me very gratifying, inasmuch as last year, I am informed, the Mississippi was so high that it was impossible to secure sufficient quantities of fish for shipment, with the result that only a single car-load was sent out during 1900. This fall, however, as I believe after a careful examination, the conditions are fit for an abundant supply, and we will be able to replenish many of the interior lakes and rivers, beginning the work of distribution about the middle of September.

Could I use the car at all seasons of the year it would be impossible to supply all the many demands made upon me for fish, but I shall endeavor to divide the output as equitably as I may among the different sections of the state.

FISH AND GAME WARDENS.

I find during my short term that it is almost impossible, with the deputy system as it now is, to fully enforce the provisions of the fish law, especially those relating to seining and dynamiting. I have at this time 150 deputies, an increase since the last report of seventy-one, but many of them are deputies in name only, inasmuch as they are business men, who will not file informations against law-breakers in their own towns, but instead are willing only to make reports to me in order that I may set on foot the prosecutions. It is simply a physical impossibility for me to go to all the places where I am called. I have attempted to do so wherever sent for, but at times there have been from ten to fifteen cases at once, and I could not attend to them all. The whole system, in my opinion, is wrong, and should be changed to one wherein compensation is paid to the deputy wardens. It can readily be appreciated that work of the character these officers are called upon to do will bring to them more or less unpopularity among certain classes in their respective localities, to say nothing of the direct enmity of those men who are proceeded against. Few men care to enforce the law when there is no pecuniary compensation, at the same time risking the ill-will of their neighbors and of the pot-hunters, who are in many cases desperate and vindictive characters. A large number of these deputies have received their appointments laboring under a misapprehension of the fee system. They have sought the appointments under the impression that there was a direct compensation for the work, but, finding that this was a mistake and that they had to depend upon the fees alone, many have been disappointed and have failed to do or seek to accomplish anything. In many









instances I have been compelled to pay a per diem and expenses for work done, believing that the state of Iowa needed the services performed and did not desire its officers to work without some compensation.

As the law now stands the fee of the informant is taxed against the poacher and is not made a part of the fine. Thus, when the poacher seeks to escape a term in jail he pays his fine, but not the fee of the deputy, and there is no way to compel him to pay this obligation save only the civil method of execution, which is in ninety-nine cases out of a hundred ineffectual. The law should be so amended as to punish the poacher and reward the deputy, and that commensurately with the hazards of the position.

To show the character of the men against whom he must act, one striking instance from Woodbury county will afford a timely illustration. Mr. James Halliday, a deputy warden of that county, found one "Peg-leg" Geist and Tom Teller, poachers, seining in McCook lake. He appeared as a witness against them, and they were convicted and fined, while their seines were destroyed. Burning with revenge, they started, immediately upon their release, for the home of Deputy Halliday, where they made a desperate assault upon him and his father, who in the encounter was struck over the head with an oar, while Teller received a shot in his leg. The next day Teller and Geist, reinforced by one Howard Teller, came again upon Mr. Halliday and his hired man working in the fields. In this attack Howard Teller was knocked senseless, and Deputy Halliday was cut in the face with a knife by Tom Teller. Mr. Halliday fired upon the latter, but the shots missed their mark. Even this assault was not sufficient for these desperate men, and Mr. Halliday has since found in his bundles of grain, while threshing, pieces of iron, placed there with evident intention to injure him and destroy his thresher. Presumably these were put there by these men or their sympathizers, which serves only to show the relentlessness of their antipathy.

I would recommend that a totally different system be adopted, and suggest the following plan. *First*, let the state be divided into districts similar to the present congressional ones. Then let good, reliable men be appointed in these to serve for a fair salary, the fines paid to go into a fund meant to pay these same deputies, that is, such part as should go to the complainant. This will render it certain that the informant would have compensation, so as to render him willing to incur the displeasure of his

neighbors, if such need be, while if reliable men be appointed this will insure good deputy service and obviate any possible tendency toward supineness because of a certain salary. The success of the plan will, in large measure, depend upon the reliability of the appointees, but for every public office there can be found men capable and honest and who will execute the duties connected with it. At any rate there should at least be made the change that the informant's fee be made a part, not of the costs, but of the fine, so that the fee will be paid by the poacher who seeks to avoid his jail sentence.

DYNAMITING AND SEINING.

The crime of dynamiting is the most inhuman of those within the warden's province, and also the most difficult to deal with. I recommend that the law should be amended as urged in the thirteenth biennial report, by former Warden Geo. E. Delavan, from which the following is an extract:

"We recommend that the law be changed so as to make the killing of fish by an explosive a felony. Under the present law the offense is made a misdemeanor, and the punishment does not fit the crime. We know of instances where thousands of choice small fish have been killed in this inhuman manner in order that the perpetrators might secure a few large ones."

The law as enacted by the Twenty-seventh General Assembly, making it a public nuisance to have in one's possession a seining net and equipment and giving the officer a right to seize the same without warrant, has been productive of much good. Our rivers and lakes in many places are swarming with carp and buffalo to the detriment of the game and the better classes of food fish. These species are destructive to the spawn of other fish, and are difficult to be ensnared, inasmuch as they will not bite at the ordinary hook. Furthermore, they multiply rapidly, and seining is prohibited as to them as well as to other fish by section 2540. I recommend that the law be so amended that they may be taken by spear or otherwise under the direction of your warden or his deputies, who shall be authorized to distribute the same as a food supply to those who are in need, or else to sell the fish thus taken in market. Such sale is feasible, inasmuch as these fish belong to those coarser families of food fish that are extensively used for food purposes.

During the winter season a great many of the small lakes and bayous freeze so solid that it is impossible for the fish to live. In several cases this spring, on the thawing of the ice, tons of all



POND AT LA BULA.



PILLSBURY POINT, OKOHOUJI.

kinds of dead fish have floated to the shore in such a decayed condition that the health authorities were compelled to remove the same at a large expense. There is, further, an entire loss of this great amount of food supply. This is especially true of Cedar lake, situated within the city limits of Cedar Rapids, where, during the spring of 1901, thousands of pounds of fish were washed ashore. I would recommend an amendment to the law that in cases of this kind your warden be given power to allow the taking of these fish, under his direction, in any manner. There would thus be saved large amounts of food now annually destroyed.

The provisions of the Minnesota law on this subject are as follows:

"Provided, further, that the board of game and fish commissioners may, upon application and satisfactory proof made to them, grant permission to fish in all shallow lakes in the state where fish are annually frozen or smothered to death, under such rules, regulations, and restrictions as they shall prescribe, and the designation by them of such lakes shall be final and conclusive."

WANTON DESTRUCTION OF FISH.

The wanton destruction of fish in our lakes during the open season by anglers, who desire to see how many fish they can catch in a given time, should be prohibited. The fish-car annually, at an expense to the state, places fish in these lakes for the benefit of sportsmen, but some fishermen wantonly strive to deplete the stock of fish in a few days. Certain parties this season at Spirit Lake, in the space of one week, sent home seven barrels of fish, and on their return home took with them two more. These fish so shipped were but the pick of their catch during the week. I would recommend that the law be so amended that the catching of more than twenty-five fish by any one person in any one day shall be deemed a wanton destruction of fish in excess of that number, and shall be a misdemeanor with a proper fine attached.

PRIVATE FISH-PONDS.

I believe that every person who has the natural facilities therefor should have a pond for the raising of fish for food. I have received many communications on this subject, and while I have not been able to do much in this line this season, on account of the condition of the water at the hatchery and the excessive hot weather of this summer, which has necessarily prevented shipments, yet I shall endeavor to fill all such demands made upon me as fast as possible, being convinced that this industry will prove

an important adjunct to the people of this state and be an economic food resource.

FURTHER RECOMMENDATIONS.

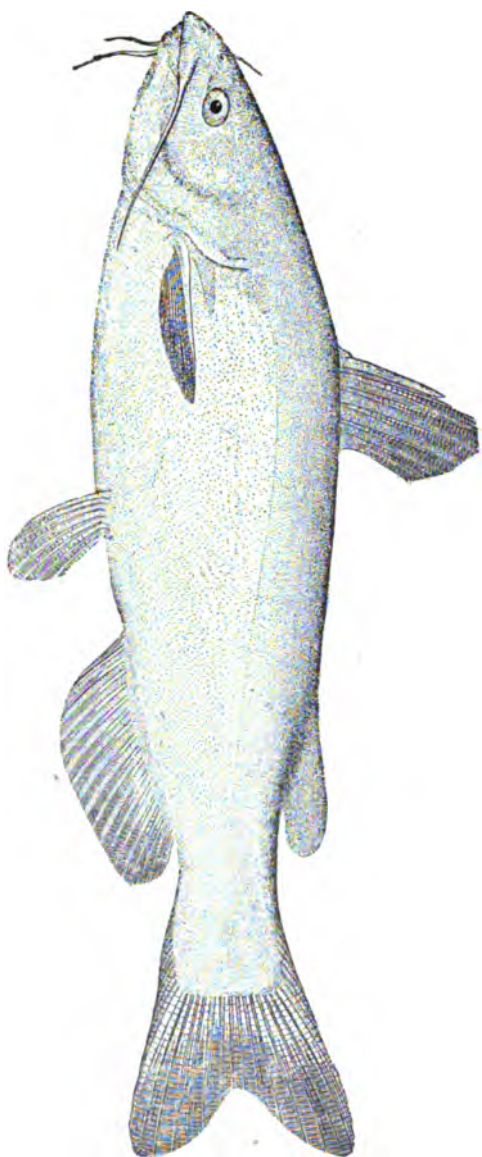
Your warden would further recommend an amendment to the law which will prevent fishing within 100 feet of any fishway. Fish congregate near such places and can be easily caught there in large quantities, so that the value of these is lessened, to say nothing of the wanton destruction that often ensues.

This season has been unprecedented in its exceedingly small rainfall. In consequence, the lakes and rivers of the state contain very little water, while, in some cases, they have dried up entirely. This has caused the destruction of a large amount of food-fish. In many cases your warden has seined them from the bayous into the rivers, and in some rivers placed them above and below the dams so as to get them into deeper water, but, in a large number of cases where the needed attention could not be given, the water has dried up and the fish have died, especially in the smaller lakes and streams.

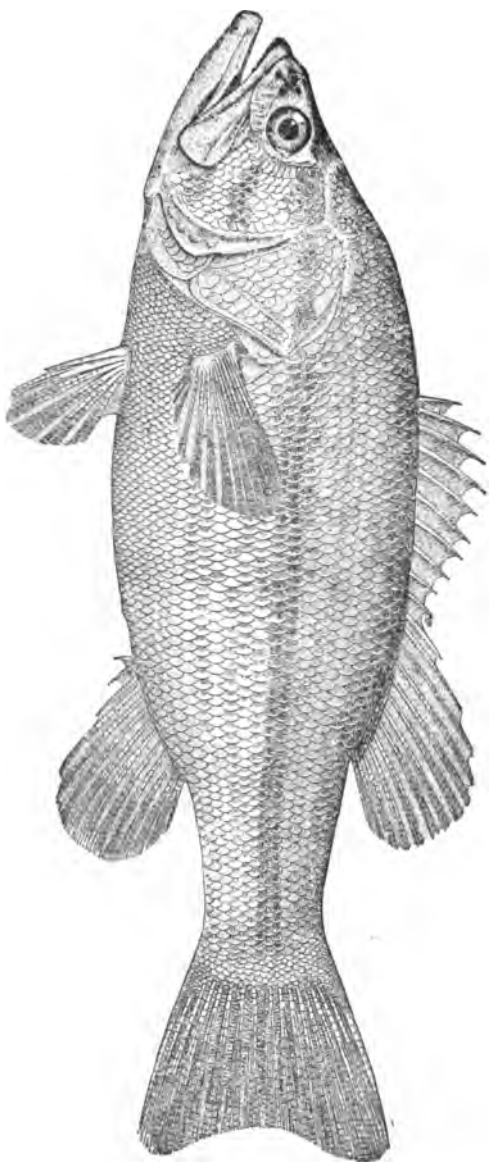
THE KILLING OF GAME-BIRDS.

This year has been excellent for the propagation of all species of game-birds. When the season opened both prairie chicken and quail were plentiful. I have taken especial interest in the enforcement of the game laws, and, while not entirely successful I have succeeded in arresting a number of poachers and in securing their conviction, and by my efforts, I trust, have prevented a wholesale slaughter. Quail are now found in abundance, and are, I am told, more plentiful than for a great many years. The shooting of prairie chicken before September 1st has cost quite a number of persons in various stations of society from \$50 to \$100 each and costs, and the lessons of these fines have prevented a good deal of illegal hunting. I would recommend that the law be changed on quail so as to make the open season between October 1st and December 1st.

In this connection, I will say that the federal law, commonly known as the Lacey act, introduced by Hon. J. F. Lacey, of Iowa, herein given in full, has been productive of much good. Poachers and pot-hunters, while not having any fear of the state laws, do not care to violate the statutes of the United States, inasmuch as under its detective system they are sure to be caught. Examples of this are the arrests made by your game warden in this state, where fines of \$100 and costs were imposed for ship-



THE CHANNEL CATFISH (*Ameiurus albidus*).



LARGE-MOUTHED BLACK BASS (*Micropterus salmoides*)

ping game out of our boundaries, all made on evidence furnished by United States marshals who seized the game in transit. Hereto is appended the Lacey act, and a copy of some instructions of the department:

AN ACT to enlarge the powers of the Department of Agriculture, prohibit the transportation by interstate commerce of game killed in violation of local laws, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the duties and powers of the department of agriculture are hereby enlarged so as to include the preservation, distribution, introduction, and restoration of game-birds and other wild birds. The secretary of agriculture is hereby authorized to adopt such measures as may be necessary to carry out the purposes of this act and to purchase such game-birds and other wild birds as may be required therefor, subject, however, to the laws of the various states and territories. The object and purpose of this act is to aid in the restoration of such birds in those parts of the United States adapted thereto where the same have become scarce or extinct, and also to regulate the introduction of American or foreign birds or animals in localities where they have not heretofore existed. The secretary of agriculture shall from time to time collect and publish useful information as to the propagation, uses, and preservation of such birds. And the secretary of agriculture shall make and publish all needful rules and regulations for carrying out the purposes of this act, and shall expend for said purposes such sums as Congress may appropriate therefor.

SEC. 2. That it shall be unlawful for any person or persons to import into the United States any foreign wild animal or bird except under special permit from the United States department of agriculture: *Provided*, That nothing in this section shall restrict the importation of natural history specimens for museums or scientific collections, or the importation of certain cage-birds, such as domestic canaries, parrots, or such other species as the secretary of agriculture may designate. The importation of the mongoose, the so-called "flying foxes" or fruit bats, the English sparrow, the starling, or such other birds or animals as the secretary of agriculture may from time to time declare injurious to the interest of agriculture or horticulture is hereby prohibited, and such species upon arrival at any of the ports of the United States shall be destroyed or returned at the expense of the owner. The secretary of the treasury is hereby authorized to make regulations for carrying into effect the provisions of this section.

SEC. 3. That it shall be unlawful for any person or persons to deliver to any common carrier, or for any common carrier to transport from one state or territory to another state or territory, or from the District of Columbia or Alaska to any state or territory, or from any state or territory to the District of Columbia or Alaska, any foreign animals or birds the importation of which is prohibited, or the dead bodies or parts thereof of any wild animals or birds, where such animals or birds have been killed in violation of the laws of the state, territory, or district in which the same were killed: *Provided*, That nothing herein shall prevent the transportation of any dead birds or animals killed during the season when the same may be lawfully captured,

and the export of which is not prohibited by law in the state, territory, or district in which the same are killed.

SEC. 4. That all packages containing such dead animals, birds, or parts thereof, when shipped by interstate commerce, as provided in section one of this act, shall be plainly and clearly marked, so that the name and address of the shipper and the nature of the contents may be readily ascertained on inspection of the outside of such packages. For each evasion or violation of this act the shipper shall, upon conviction, pay a fine of not exceeding two hundred dollars; and the consignee knowingly receiving such articles so shipped and transported in violation of this act shall, upon conviction, pay a fine not exceeding two hundred dollars; and the carrier knowingly carrying or transporting the same shall, upon conviction, pay a fine not exceeding two hundred dollars.

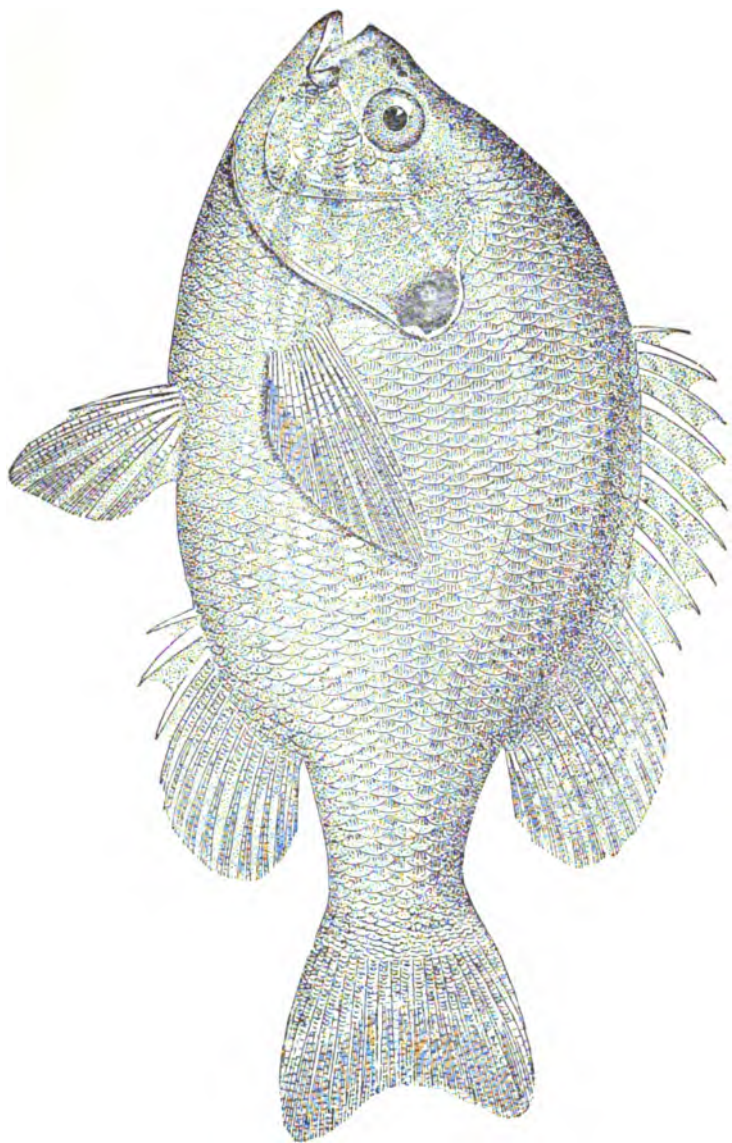
SEC. 5. That all dead bodies, or parts thereof, of any foreign game animals, or game or song birds, the importation of which is prohibited, or the dead bodies, or parts thereof, of any wild game animals, or game or song birds transported into any state or territory, or remaining therein for use, consumption, sale, or storage therein, shall upon arrival in such state or territory be subject to the operation and effect of the laws of such state or territory enacted in the exercise of its police powers, to the same extent and in the same manner as though such animals and birds had been produced in such state or territory, and shall not be exempt therefrom by reason of being introduced therein in original packages or otherwise. This act shall not prevent the importation, transportation, or sale of birds or bird-plumage manufactured from the feathers of barnyard fowl.

Approved, May 25, 1900.

INTERSTATE TRAFFIC IN ANIMALS OR BIRDS KILLED OR SHIPPED IN
VIOLATION OF STATE LAWS.

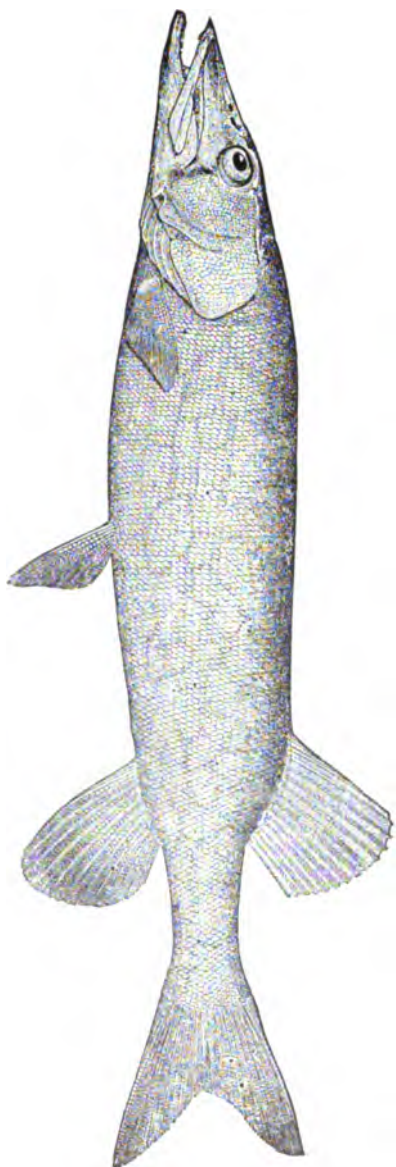
The attention of sportsmen, commission merchants, shippers, and express agents is especially called to sections 3, 4, and 5, which make it unlawful to ship from one state to another animals or birds which have been killed or captured in violation of local laws, and which require all packages containing animals or birds to be plainly marked so that the name and address of the shipper and the nature of the contents may be ascertained by inspection of the outside of such packages. Common carriers are cautioned to notify their agents to insist that all packages supposed to contain game or other animals or birds must be marked with the shipper's name and the contents. Shipment in any form that tends to conceal or obscure the nature of the contents or the shipper's name and address is plainly an evasion of the act, and the penalty applies to evasions as well as to violations of the law. The act also prohibits interstate commerce in game, though killed in open seasons, if the law of the state in which such game is killed prohibits its export.

In referring to these sections, the House committee on interstate commerce reported as follows: "The killing or carrying of game within the limits of a state is a matter wholly within the jurisdiction of the state, but when the fruits of the violation of state law are carried beyond the state the nation alone has the power to forbid the transit and to punish those engaged in the traffic. This bill will give the game wardens the very power that they now lack and which will be the most effective for the purpose of breaking up this



PUMPKIN-SEED OR COMMON SUNFISH (*Lepomis gibbosus*).

THE PICKEREL (*Esox reticulatus* L. Sauer).



commerce. * * * In some of the states the sale of certain game is forbidden at all seasons without regard to the place where the same was killed. The purpose of these laws is to prevent the sale of game shipped into the state from being used as a cloak for the sale of game killed within the state in violation of local laws." Section 5 of the act is intended to meet this difficulty by subjecting imported animals, birds, or game, whether introduced in original packages or otherwise, to the laws of the state in which imported.

I consider that the spring shooting of ducks should be prohibited, and I would recommend that the law be so amended that the closed season for ducks shall be between the first day of January and the first day of September.

SELLING OF GAME BY MERCHANTS.

Section 2552 of the Code prohibits and makes it a crime for any person to trap, shoot, or keep for traffic, prairie chicken, woodcock, quail, or ruffed grouse.

Section 2554 makes it an offense for any person, company, or corporation to buy, sell, or have possession of any such birds or animals during the period when the killing thereof is prohibited, except during the first five days of such prohibited period.

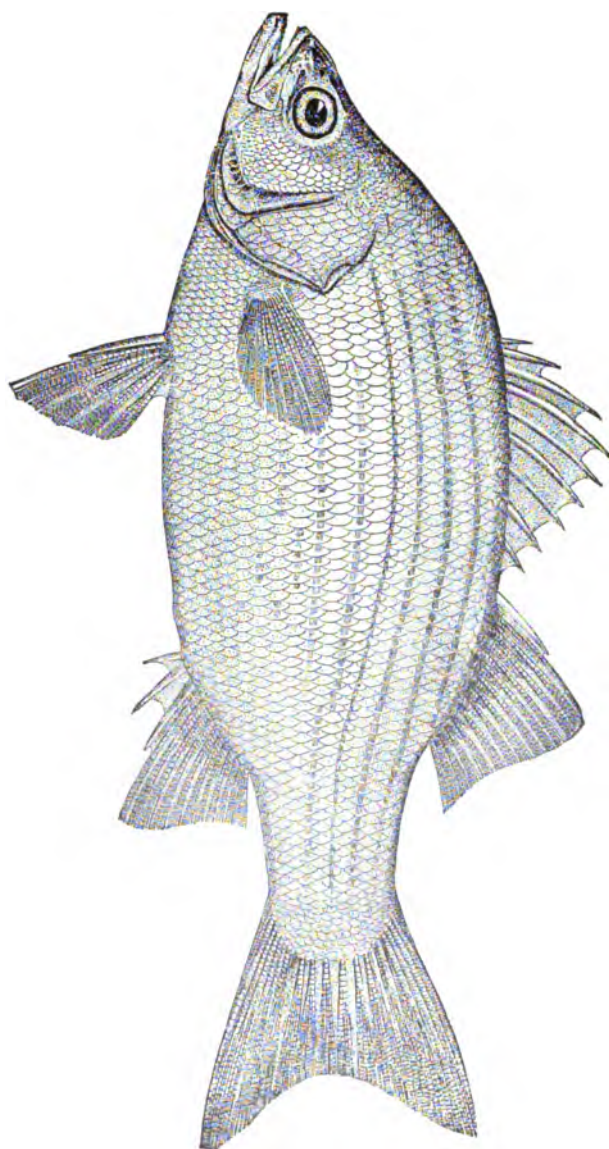
Section 2555 provides that no person, company, or corporation shall at any time ship, take, or carry out of the state any of the birds or animals named; but that it shall be lawful to ship to any person within the state, during the period when the killing of such birds is not prohibited, any of the game-birds mentioned, not to exceed one dozen in any one day, provided an affidavit, made before some person authorized to administer oaths, to the effect that the birds have not been unlawfully killed, bought, sold, or had in possession, and are not shipped for sale or profit, is made and attached to the birds so shipped. The attorney-general informs your warden under date of September, 6, 1901, that neither of these sections, in terms or in language which will bear such construction as prohibits the sale of such game-birds within the state during the open period. While it was the evident intent of the legislature to prohibit the sale of game-birds within the state at the time the law was enacted, the sections intended to cover this point in the opinion of the attorney-general cannot be so construed. I would recommend that the law be so amended as either to prohibit the sale of game-birds in any manner or by any person in this state, or to allow them to be sold only during the open season. In this connection, on this subject which has both a commercial bearing and a sport-

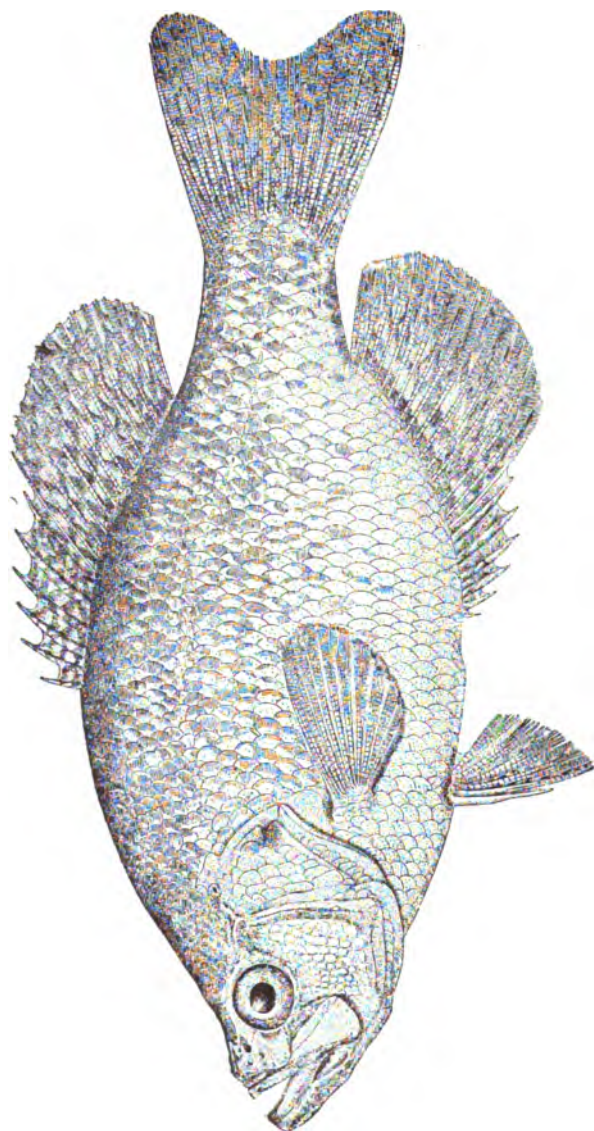
ing interest, it may be well to call attention to the fact that the state is accused of favoring the sporting interest in preference to the commercial. Those who are not hunters ask that they may be allowed to have the privilege of purchasing wild game during the open season, while the sportsmen claim that if commercial traffic be permitted the game will soon be extinct. This is a question for the legislature to decide, and when so decided your warden will endeavor to see that the provisions of the law are enforced. The state of Illinois provides for the sale during the open season of those game-birds that are not killed within the limits of the state, thus protecting its own game-birds from the raids of the pot-hunters.

MEANDERED LAKES.

The question of the shore-line of the meandered lakes of the state is causing a great deal of controversy, as parties, who own land contiguous to the lakes where the water has dried up and receded have in some cases extended their fences in to the water edge as it now is. They then have claimed ownership of this land, endeavoring to prevent trespassing upon the same under the law, section 2560, "Hunting upon cultivated or inclosed land." Under section 2549 of the code, cities, towns, and counties have the right to condemn property and build dams across the outlet of any lake in their county both for the purpose of keeping the water to the ordinary level of the lake and to prevent the escape of fish. In many cases this has been done, the water thus being brought back to the ordinary level, with the result that some of the shore line as it was in low water has been covered. Your warden finds that in several cases the dams have been blown up and in others torn down. While this matter does not technically come under my duties as warden, yet the destruction of the fish placed in these waters at the expense of the state compels me to take notice of the same. Could the meandered lines of these lake be remeandered and permanent posts set, the trouble could be avoided. I would recommend that an appropriation be made for the purpose of defining the lines of the different lakes and making the same permanent. The following is a list of Iowa's meandered lakes, showing the extent of the interests involved and the necessity for some action:

WHITE OR SILVER BASS (*Rocusschrysof*).





THE CRAPPIE (*Pomoxis annularis*.)

IOWA'S MEANDERED LAKES.

A statement of the meandered lakes of Iowa, their locality, area and shore line, as shown by the meander notes of the government survey of same.

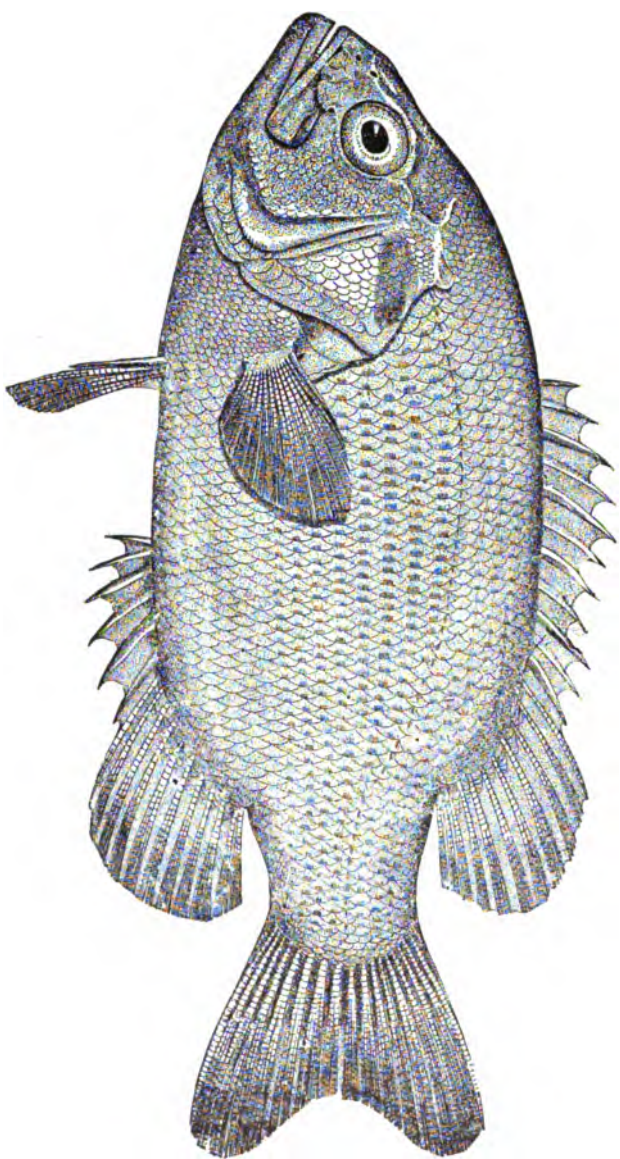
LAKE.	LOCALITY OF LAKE.			ESTIMATED SHORE LINE.
	Township.	Range.	COUNTY.	
				Miles. Chains. Links.
*Goose lake, in sections 28, 29, 32 and 33.....	83 N	E	Clinton	2 301.55 48
Muscatine slough, in sections 7, 17, 20, 21, 28 and 29.....	74 N	W	Louisa	16 570.00 40
Clum lake.....	75 N	2	Louisa	31 152.00 15
Green bayou, in sections 26, 27, 28, 29, 31, 32 and 33.....	66 N	2 and 3	Lee	8 271.00 11 1/4
Keokuk lake, in sections 13, 22, 23, 24, 26 and 27.....	76 N	3	Muscatine	26 454.00 37
Lake in sections 1 and 2.....	66 N	3	Allamakee	26 163.86 33
Lake in sections 16, 20 and 21.....	88 N	4	Delaware	1 44.25 52
Two lakes in sections 13, 24 and 25.....	100 N	4	Allamakee	3 200.00 27
Swan lake.....	80 and 81 N	7	Johnson	3 45.00 33
Lake in section 4, 5, 8, 9, 16 and 17.....	81 N	7	Allamakee	1 679.00 55
Lake in sections 30 and 31.....	81 N	7	Johnson	1 62.73 16
Clear lake.....	96 N	22	Cerro Gordo	2 3,643.37 6
Lake Rice.....	99 N	22 and 23	Worth and Winnebago	13 600.00 42
Silver lake, in sections 14 and 15.....	100 N	23	Worth	2 318.00 75
Bright's lake, in sections 7, 8 and 17.....	100 N	23	Hamilton	3 165.00 8
Iowa lake, in sections 14, 15, 23, 24, 25 and 26.....	88 N	23	Hamilton	2 185.00 50
Wall lake, in sections 9, 10, 15 and 16.....	86 N	24	Hamilton	6 304.56 33
Lake in section 27.....	87 N	24	Hamilton	2 142.00 55
Cairo lake.....	87 N	24 and 25	Hamilton	2 1,382.00 43
Walled lake, in sections 2, 3, 10, 11, 14 and 15.....	90 N	24	Wright	5 986.85 91
Cornelia lake, in sections 9 and 16.....	92 N	24	Wright	7 332.42 71
Erin lake, in sections 21, 22, 27 and 28.....	92 N	24	Wright	1 107.07 32
Twin lake, in sections 28 and 29.....	93 N	24	Wright	1 193.00 67
Lake, in sections 19, 20, 29 and 30.....	94 N	24	Hancock	3 100.00 4
Lake.....	96 N	24 and 25	Hancock	5 915.00 84
Duck lake, in sections 20 and 21.....	100 N	24	Hancock	1 71.30 40
Lake, in se qr of section 24.....	96 N	25	Winnebago	1 59.00 47
Lake, in sections 9, 10, 15 and 16.....	97 N	25	Hancock	2 252.68 13
Impassable marsh.....	91 and 92 N	27	Humboldt	9 1,743.20 15

IOWA'S MEANDERED LAKES—CONTINUED.

LAKE.	LOCALITY OF LAKE.			ESTIMATED SHORE LINE.
	Township	Range.	COUNTY.	
Owl lake, in sections 21, 22, 27 and 28. Lake	02 90 and 91	27 29 and 30	Humboldt	772 14 211 00
Bass lake.....	01	29	Webster and Humboldt.....	60 00
Bancroft lake, in sections 10, 14 and 15. Lake	84	30 and 31	Kossuth	60 79
Lake, in section 27.....	100	30	Greene.....	715 00
Lake, in sections 28.....	100	30	Kossuth	76 43
Lake, in sections 9 and 10.....	100	30	Kossuth	147 40
Lizard lake, in sections 12 and 27.....	91	31	Pocahontas	48 00
Walled lake.....	80	31	Emmet	253 38
Lower lake, in sections 11, 12 and 14.....	86	32 and 33	Calhoun	285 00
Lake (medium).....	66 and 97	32 and 33	Calhoun	571 00
Swan lake (seven or eight miles long).....	100	32 and 33	Palo Alto	980 00
Lake Okoboji, in sections 10, 11 and 12.....	100	32 and 33	Emmet	23 00
Tremont lake.....	86	32 and 33	Emmet	945 00
Lake, in section 10.....	88	33	Emmet	147 00
Lake, in sections 1, 2, 11 and 12.....	88	33	Calhoun	166 84
High lake, in sections 11, 12 and 13.....	08	33	Calhoun	490 00
Lake, in sections 14, 15 and 23.....	08	33	Emmet	461 30
Swan lake, in sections 27, 28, 33 and 34.....	09	33	Emmet	337 00
Lake, in sections 16 and 17.....	100	33	Emmet	424 28
Tow Head lake, in sections 23 and 24.....	80	33	Emmet	177 20
Clear lake.....	91 and 92	34	Calhoun	105 05
Two lakes, in sections 9, 15, 16 and 17.....	02	34	Pocahontas	170 00
Rush lake, in sections 20 and 21.....	03	34	Pocahontas	616 00
Silver lake, in sections 18, 19, 21, 28 and 29.....	04	34	Palo Alto	591 15
Lake, in sections 29 and 30.....	05	34	Palo Alto	656 00
Lake, in sections 16, 17, 19, 20 and 21.....	06	34	Palo Alto	102 57
Eagle lake, in sections 11, 14 and 23.....	100	34	Palo Alto	458 43
Lost island and Pelican lakes.....	06 and 97	35 and 36	Emmet	3 45 00
Trumbull lake.....	05 and 97	35	Palo Alto and Clay.....	1 73 00
Twelve Mile lake, in sections 20, 21 and 29.....	05	34	Clay.....	3 15
Cheever lake, in sections 20, 21 and 29.....	09	34	Emmet	27 23
Lake.....	80	34	Emmet	316 43
Lard lake, in sections 4, 5, 8 and 9.....	80	35	Emmet and Dickinson.....	219 00
Rush lake, in sections 8 and 17.....	80	35	Sac	216 19
Lake.....	93 and 94	35	Sac	63 60
			Buena Vista and Clay.....	173 97
				2 16 55
				3 15
				27 23
				3 15
				60 31
				48 31
				2 16 55
				3 15
				27 23
				3 15
				60 31
				48 31
				2 16 55
				3 15
				27 23
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				60 31
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				2 16 55
				3 15
				27 23
				3 15
				60 31
				48 31
				2 16 55
				3 15



THE PIKE (*Esox lucius*).



THE ROCK BASS OR RED EYE (*Ambloplites rupestris*).

ESTIMATE OF FUNDS NECESSARY FOR 1902 AND 1903.

For protection, distribution, and reproducing fish for two years..	\$ 4,000.00
For payment of deputy fish wardens.....	3,000.00
For payment of deputy game wardens	1,000.00
For assistant's salary.....	500.00
For gathering fish at Sabula for the purpose of restocking rivers and lakes.....	4,000.00
For railway transportation, fish car.....	1,000.00
For protection of game.....	2,500.00
	<u>\$16,000.00</u>

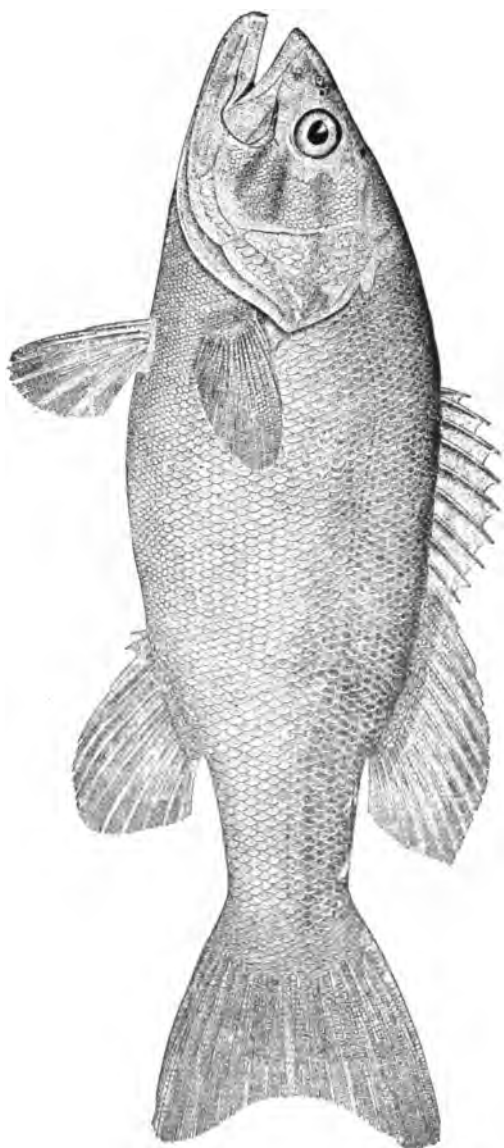
RECEIPTS AND EXPENDITURES.

The last biennial report gave the exhibit of receipts and expenditures from April 1, 1898, to November 30, 1899. The balance of the expenditures for the fiscal year ending March 31, 1900, is as follows:

EXPENDITURES.	
December, 1899.....	\$ 363.43
January, 1900.....	141.27
February, 1900.....	136.13
March, 1900.....	724.40
	<u>\$ 1,365.23</u>
Amount accounted for in reports of 1898 and 1899.....	6,724.47
	<u>\$ 8,089.70</u>
Appropriation by the Twenty-eighth general assembly..	\$15,000.00

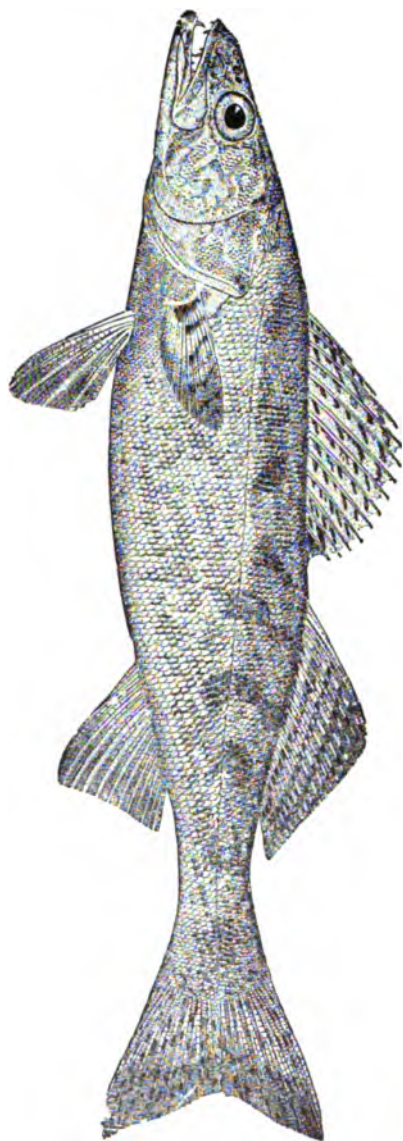
EXPENDITURES.	
April, 1900	277.91
May, 1900.....	401.50
June, 1900	238.04
July, 1900	754.69
August, 1900.....	714.76
September, 1900 ..	275.92
October, 1900	286.61
November, 1900	281.32
December, 1900.....	178.19

EXPENDITURES.	
January, 1901.....	\$ 86.32
February, 1901.....	85.38
March, 1901.....	145.37



THE SMALL-MOUTH BLACK BASS (*Micropterus dolomieu*).





THE WALL-EYED PIKE (*Stizostedion vitreum*).

April, 1901.....	323.02
May, 1901.....	288.95
June, 1901.....	229.51
July, 1901.....	434.49
August, 1901.....	537.95
September, 1901.....	474.68
October, 1901.....	1,211.89

Total	\$ 7,226.50
Balance undrawn.....	\$ 7,773.50

An itemized report may be found on file with the auditor of state. The unexpended balance shown above is largely on account of the retarding of the work at Sabula in the fall of 1900 by high water in the Mississippi. While, as before, noted, only one car-load of fish was shipped during that year, in the ordinary good season there should be placed not less than twenty to twenty-five carloads of food fish in the various interior waters of the state.

DISTRIBUTION OF FISH FROM SABULA BY STATE FISH CAR
"HAWKEYE."

1900.

Spirit Lake at Orleans.

1901.

Turkey river at Elkader.
Des Moines river at Ottumwa.
Raccoon river at Perry.
Clear lake at Clear Lake.
Nodaway river at Corning.
Wall lake at Lake View.
Des Moines river at Humboldt
Maquoketa river at Maquoketa.
Storm lake at Storm Lake.
Spirit lake at Orleans.
Boone river at Webster City.
Turkey river at Elgin.
Turkey river at West Union.
Okoboji lake at Okoboji.
Wapsie river at Independence.

Each of the above places has been visited by the fish-car, and except Independence, furnished by courtesy of United States fish car a full load, consisting of black, silver and rock bass, crappie, pike, pickerel, catfish, perch, and sunfish has been deposited in the lakes and rivers. The car in this work has made mileage of over 8,000 miles.

WARDEN NO AUTHORITY TO FURNISH FISH TO PRIVATE PARTIES.

On a former page of this report reference has been made to the advisability of furnishing fish to stock private ponds. In order that this may be done there will have to be some action taken by the legislature, since by a recent decision of the supreme court, in the case of the State of Iowa against Fred Sears, appellant, from Sac county (opinion hereinafter given in full), your warden is prevented from furnishing fish of any kind for food, propagation, or other purposes to private parties. In many cases private individuals, at a large expense, have built ponds on their grounds for the purpose of raising food-fish, and your warden has considered it a part of his duties to supply fish to these parties, believing that as the United States, and most of the states of the Union other than Iowa, foster this kind of industry among its people, whereby they can raise their own food-fish, and also understanding that this was the intent of our own state law, had promised many parties shipments of fish this fall. Under this decision, these promises can not be lawfully kept. I would recommend that the law be so amended that your warden will have the power to furnish private parties with fish as hereinbefore indicated.

The following is the text of the decision in full:

STATE OF IOWA vs. FRED SEARS, Appellant.

(Appeal from the District Court of Sac County.)

S. M. ELWOOD, Judge.

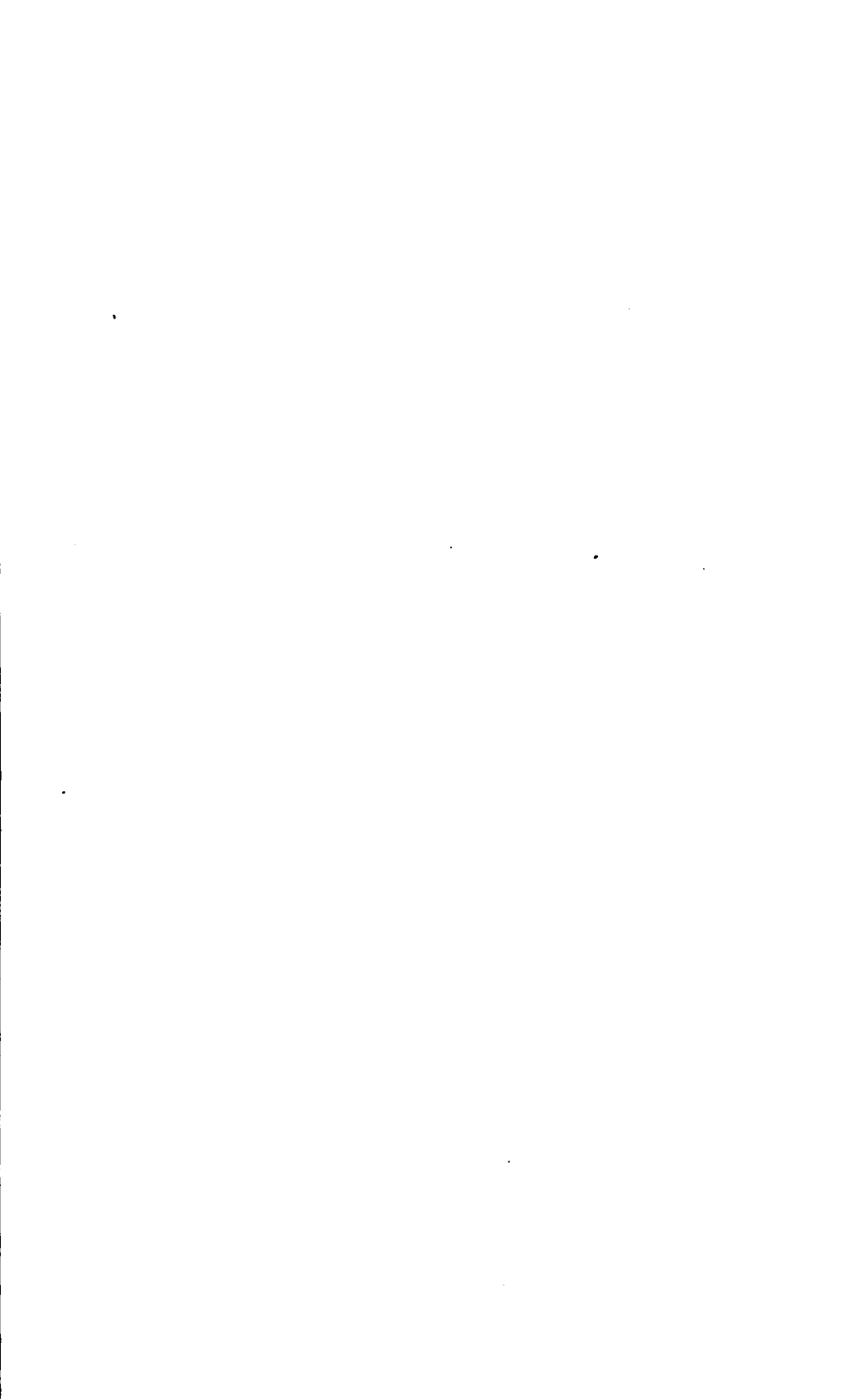
The defendant was accused and convicted in (Justice) Court of catching ten young pickerel with a seine from Wall Lake. Upon appeal to the district court, it was admitted the fish were caught in the manner alleged, but by virtue of the following permit signed by the state fish and game warden: "By the power invested in me as fish and game warden of the state of Iowa, I hereby grant Mr. Fred Sears the privilege of drawing a seine in the public waters of the state, for the purpose of seining some young game-fish for his pond, and no other purpose whatever. This permit to expire November 15, 1898."

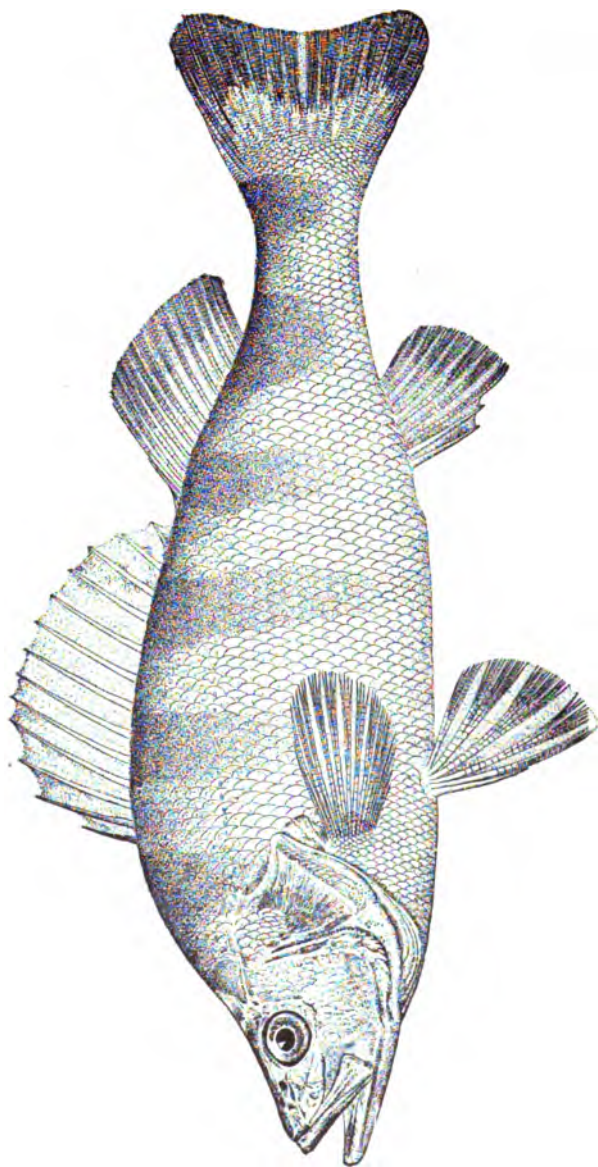
GEORGE E. DELAVAN.

This was adjudged to be in excess of that officer's authority and to afford no protection. The defendant appeals from judgment imposing statutory penalties.

HASTINGS & BRASTED and WILL E. JOHNSTON, for appellant,
MILES W. NEWBY, for appellee.

LADD, J.—Unless the fish and game warden of the state had authority to permit citizens to take fish from public waters with a seine to stock private ponds, the defendant was properly convicted. By section 2546 of the code: "The warden may take from any of the public waters of the state, at any time and in any manner, any fish for the purpose of propagating or restock-





YELLOW PERCH (*Percina flavescens*)

ing other waters, or exchanging with fish commissioners of other states or of the United States."

The accepted canons of construction limit the words "other waters" to the kind previously mentioned, i. e., public waters. Some of a designated class having been spoken of, others must be presumed to have reference to those of the like kind. But a different construction is said to have been given this statute in usage for many years. An examination of the record does not sustain this claim. The particular provision first appeared in Chapter 34 of the acts of the Twenty-third General Assembly, reading: "It shall be lawful for the state fish commissioner to take from any of the public waters in any manner any fish for the purpose of propagation or restocking other waters." Up to that time the removal of fish from some of the streams and lakes of the state to restock others was not contemplated by any of the legislation on the subject. Thus the object stated in chapter 50 of the acts of the Fifteenth General Assembly was, "to forward the restoration of fish to the rivers and waters of this state." Chapter 70 of the acts of the Sixteenth General Assembly directed the distribution of the fish produced in the hatchery only. By chapter 80 of the acts of the Seventeenth General Assembly it was made the duty of the fish commissioner, "to forward the restoration of fish to the rivers and waters of the state and to stock the same with fish from said hatching-house and elsewhere." "Elsewhere" as here used cannot have meant from the very rivers and waters proposed to be restocked. Certainly no authority has ever been given this officer to remove fish from the very waters it was his duty to restock and give to private parties. Nor is there any showing that such has ever been the practice of the fish commissioner. Whether he may distribute fry from the hatchery to owners of private ponds is a different question and not now before us. It may be remarked, however, that his authority to do this, under the present code, is at least doubtful. As the fish and game warden had no authority himself to take fish from the public waters for private ponds he could not empower the defendant to do so. The information in charging the acts of defendant to have been unlawful negatived the suggestion that he may have been taking the fish for some lawful purpose.

Affirmed.

ARRESTS AND PROSECUTIONS.

During the period between April 1 and August 30, 1901, arrests have been made, parties fined, and seines, spears, and other illegal devices destroyed or forfeited to the state in the following counties:

Buena Vista	Jefferson	Polk
Woodbury	Van Buren	Monona
Pottawattamie	Dickinson	Scott
Jackson	Palo Alto	Boone
Howard	Kossuth	Lee
Marshall	Lyon	Floyd
Clinton	Cherokee	Calhoun
Winneshiek	Harrison	Jasper
Cerro Gordo	Chickasaw	Butler
Wright	Greene	Sac
Humboldt	Page	Iowa
Dubuque	Grundy	

